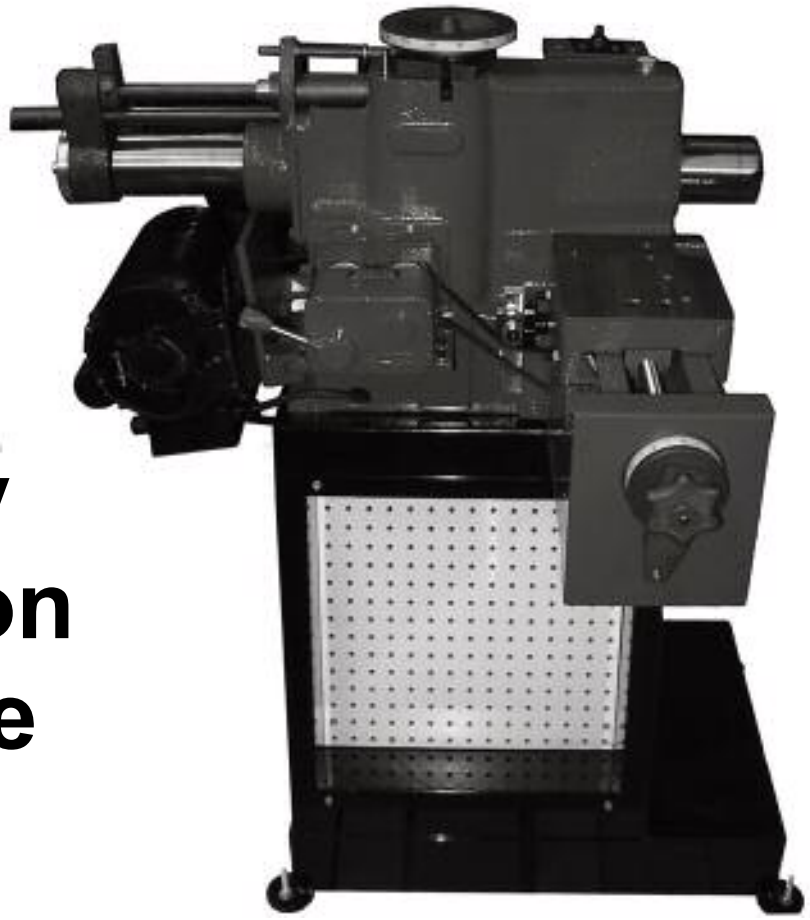
204C
Heavy Duty Combination Brake Lathe



Instruction Manual and Parts List

Van Norman 500 57th St., Marion, IA 52302 888-855-1789 319-377-9101 (FAX)

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Equipment specifications, options and accessories subject to change without notice.

WARRANTY

Flywheel Grinders, 777 and 204C Brake Lathes

Van Norman will repair and/or replace, free of charge (FOB factory) all such defective parts, only when returned to factory with shipping charges prepaid. This warranty does not cover parts and supplies (wheel dresser/diamonds/abrasives) consumed in normal operation of the machine.

Van Norman disclaims all other warranties, expressed or implied, as to the quality of any goods, including implied warranties of MERCHANTABILITY and FITNESS FOR PARTICULAR PURPOSES. UNDER NO CIRCUMSTANCES WHATSOEVER, SHALL **Van Norman** BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON LOST GOODWILL, LOST RESALE PROFITS, WORK STOPPAGE, IMPAIRMENT OF OTHER GOODS OR ARISING OUT OF BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, BREACH OF CONTRACT, NEGLIGENCE OR OTHERWISE, EXCEPT ONLY IN THE CASE OF PERSONAL INJURY.

Because of **Van Norman's** constant program of product improvement, specifications are subject to change without notice.

VAN NORMAN **PROVIDES A LIMITED WARRANTY ON PRODUCTS WHEN PURCHASED IN A NEW AND UNUSED CONDITION TO BE FREE FROM DEFECTIVE MATERIAL OR WORKMANSHIP FROM DATE OF PURCHASE FOR A PERIOD OF ONE YEAR.**

This warranty does not apply to a product that has been purchased in used condition, that has failed due to improper installation, repairs, service or that has sustained damage caused by accident, improper use or shipment.

For further information or questions, please contact **Van Norman at 888-855-1789 or fax 319-377-9101.**

PLEASE RETAIN THIS WARRANTY FOR YOUR RECORDS

RECEIVING SHIPMENT

Upon taking delivery of your machine, carefully inspect the assembly before removing the crating and packing materials.

If evidence of damage exists, contact the shipper and Van Norman immediately. Although Van Norman is not responsible for damage incurred during transit, you will be provided assistance in preparation and filing of any necessary claims.

CAREFULLY READ THIS MANUAL BEFORE ATTEMPTING TO SETUP OR OPERATE THIS MACHINE.

IMPORTANT NOTE

Always have your serial number ready when communicating with Van Norman regarding parts or service.

Keep this manual in a safe place.

Date Received: _____

Serial Number: _____

(Serial Number location: Upper left corner at rear of unit)

SAFETY FIRST

This manual has been prepared for the owner and those responsible for the maintenance of this machine. It's purpose aside from proper maintenance and operations, is to promote safety through the use of accepted practice. READ THE SAFETY AND OPERATING INSTRUCTIONS THOROUGHLY BEFORE OPERATING THE MACHINE.

In order to obtain maximum life and efficiency from your machine, follow all the instructions in the operating manuals carefully.

The specifications put forth in this manual were in effect at the time of publication. However, owing to Van Norman's policy of continuous improvement, changes to these specifications may be made at any time without obligation.

SAFETY INSTRUCTIONS

1. Read, understand and follow the safety and operating instructions found in this manual. Know the limitations and hazards associated with operating the machine.

2. Eye Safety: Wear an approved safety face shield, goggles or safety glasses to protect eyes when operating the machine.

3. Grounding the Machine: Machines equipped with three prong grounding plugs are so equipped for your protection against shock hazards and should be plugged directly into a properly grounded three-prong receptacle in accordance with national electrical codes and local codes and ordinances. A grounding adapter may be used. If one is used, the green lead should be securely connected to a suitable electrical ground such as a ground wire system. Do not cut off the grounding prong or use an adapter with the grounding prong removed.

4. Work Area: Keep the floor around the machine clean and free of tools, tooling, stock scrap and other foreign material and oil, grease or coolant to minimize the danger of tripping or slipping. Van Norman/Kwik-Way recommends the use of anti-skid floor strips on the floor area where the operator normally stands and that each machine's work area be marked off. Make certain the work area is well lighted and ventilated. Provide for adequate workspace around the machine.

5. Guards: Keep all machine guards in place at all times when machine is in use.

6. Do Not Overreach: Maintain a balanced stance and keep your body under control at all times.

7. Hand Safety: NEVER wear gloves while operating this machine.

8. Machine Capacity: Do not attempt to use the machine beyond its stated capacity or operations. This type of use will reduce the productive life of the machine and could cause the breakage of parts, which could result in personal injury.

9. Avoid Accidental Starting: Make certain the main switch is in the OFF position before connecting power to the machine.

10. Careless Acts: Give the work you are doing your undivided attention. Looking around, carrying on a conversation and horseplay are careless acts that can result in serious injury.

11. Job Completion: If the operation is complete, the machine should be emptied and the work area cleaned.

12. Disconnect All Power and Air to Machine before performing any service or maintenance.

13. Replacement Parts: Use only Van Norman/Kwik-Way replacement parts and accessories; otherwise, warranty will be null and void.

14. Misuse: Do not use the machine for other than its intended use. If used for other purposes, Van Norman/Kwik-Way Products Inc. disclaims any real or implied warranty and holds itself harmless for any injury or loss that may result from such use.

SPECIFICATIONS

Rotor

Capacity…….. 4" - 24" (102-610 mm)
Maximum Friction Surface……. 5 "(127 mm)Maximum
Maximum Thickness…….. 2.5 "(64 mm)

Drum

Capacity……. 6" – 28" (152–711 mm)
Maximum Depth…… 8.75" (222 mm)

Flywheel (Flat or Stepped)
Capacity……. 6" – 24" (152–610 mm)
Maximum Friction Surface…… 5" (127 mm)

Spindle Speeds……. 60, 100, 170 RPM

Feed Speeds Infinitely Variable 0 to —
Per minute, in. (mm)……. 3.375" (85 mm)
Per revolution, in. (mm)……. 0.020 (508 mm)

Motor…… 1 HP (.700 kw)

Weight

204C
Machine Net Weight…….. 643 lbs. (292 kg)
Domestic Shipping Weight…… 730 lbs. (331 kg)
Export Shipping Weight……. 835 lbs. (379 kg)

Van Norman is committed to product innovation and improvement and therefore reserves the right to change product specifications without notice.

INSTALLATION

Machine "Prep"

1. Carefully uncrate the lathe and wash off the anti-rust oil or any dirt accumulated during shipment. Kerosene or any approved commercial solvent may be used. **DO NOT USE GASOLINE.**

Locate and Position

1. Select a location, which provides a permanent LEVEL foundation — preferably a concrete floor. Ample space should be provided for the operator to move completely around the machine. We recommend 30" from the wall. Then permanently secure machine in place using the four mounting feet on each corner of the machine base.

Electrical Motors

1. Additional electrical devices or special wiring that may be required in your area should be bought locally. Any Overload or Undervoltage protection devices are not furnished as standard equipment and may be purchased locally or by Special Quote from Van Norman. The main spindle is to revolve CLOCKWISE when facing the work light.
2. Main Spindle Motor draws 13.2 amps on 120V wiring and 6.6 amps on 230V wiring.

Lubrication

1. Use regular No. 40 S.A.E. non detergent oil in all cups, the “Zero-Max”, and the main body.
2. The oil level in both the “Zero-Max” and main body were filled at the factory. Please check these levels prior to running the machine.
   a. Main body oil should be filled to hole (Figure 2A).
   b. The “Zero-Max” should be filled to within 3/4 inch of the fill hole (Figure 1).

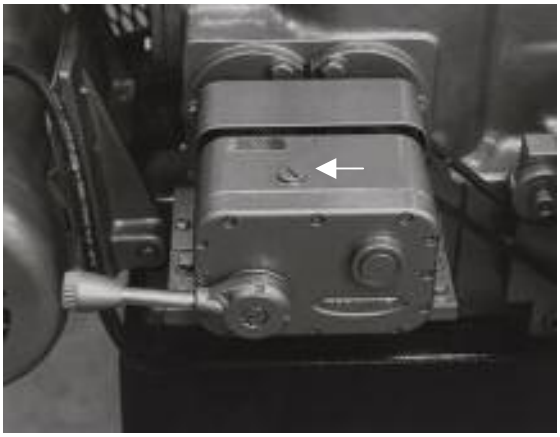

Figure 1

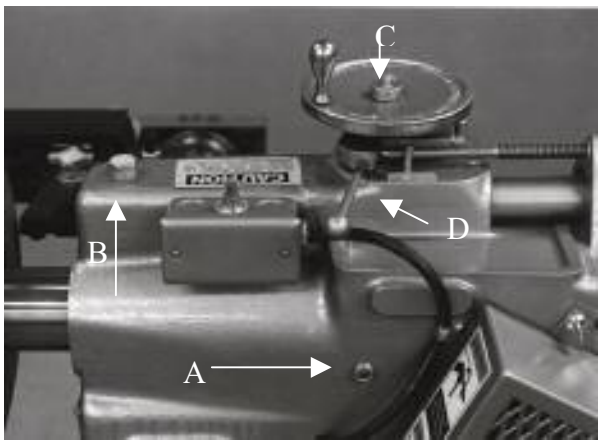

Figure 2

3. The Vertical Shaft (Figure 2C) and Leadscrew Nut (Figure 2D) should be oiled daily with 3-5 drops of oil.

INSTALLATION (continued)

4. Grease Spindle Bearing (Figure 3) once a month using a lithium based grease with moly. The grease should be an NLGI Grade 1, GC-LB.

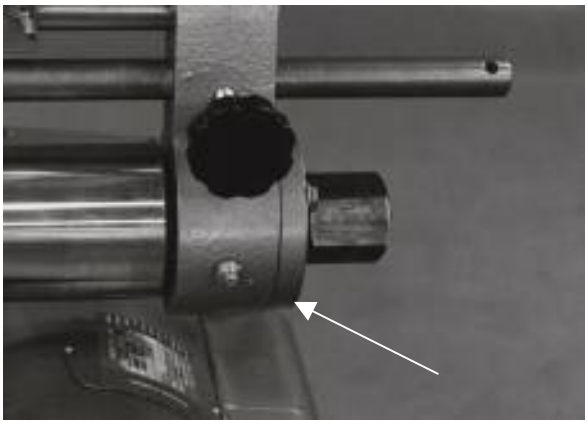

Figure 3

Cleaning / Maintenance

1. Do not use an air hose to clean machine. Use a brush to clear chips away. Clean daily after use.
2. DO NOT use Gasoline to clean machine, use Kerosene or any approved solvent.
3. If machine is not used on a regular basis, wiping with No. 10 S.A.E. oil between uses is advisable.

1. Spindle Stop
2. Handwheel for Spindle Position
3. Oil Fill (Oil Daily #30)
4. On/Off/Light Switch
5. Oil Fill & Breather
6. Spindle Arbor
7. Tool Bar (for Drum Turning) - 204S
8. Tool Holder Turret
9. Handwheel to position Tool Bit for Drum Turning - 204S
10. Chip Tray
11. Tool Storage Area
12. Speed Control Handle
13. Speed Lock Knob
14. Drain Plug

COMPONENT/CONTROL IDENTIFICATION AND FUNCTION

1. Spindle Stop
2. Handwheel for Spindle Position
3. Oil Fill (Oil Daily #30)
4. On/Off/Light Switch
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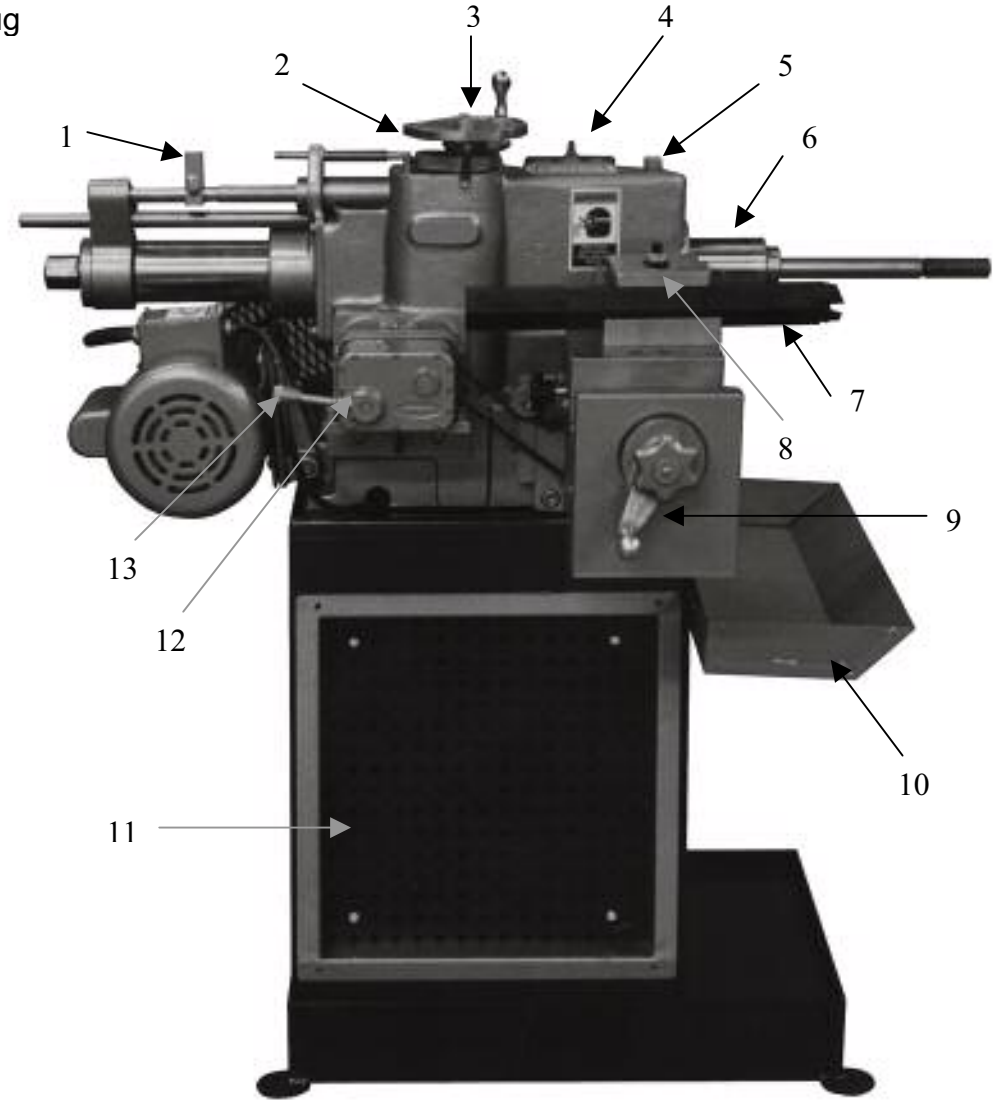


STANDARD & OPTIONAL EQUIPMENT

STANDARD MACHINES

204C Disc/Drum Lathe with Powered & Manual Cross-Feed Slides, Base and Standard Equipment

Part No.	Description
804-2474-01	115V, 60 Hz, 1 Ph
804-2474-05	230V, 60 Hz, 1 Ph
804-8651-44	230V, 50 Hz, 1 Ph

STANDARD EQUIPMENT

804-8690-56	Twin Cutter Assembly
804-8671-10	Tool Bar for Drums
804-3021-71	Tool Bit Holder for Drums
804-8665-63	Carbide Bit Package Rotor Bits, 4 (3 cutting edges) Drum Bits, 2 (2 cutting edges)
	Arbor Components
804-2040-42	1" Arbor w/Nut & Washer (25.4 mm)
000-1806-70	Spring
109-1032-09	Spacer, 1" (25.4 mm)
109-1033-06	Spacer, 2" (50.8 mm)
804-2040-44	Draw Bar
804-8658-22	**Double Ended Cone Set for 1" Arbor**
804-8658-23	Cone, 1.32" x 1.67" (33.53 x 42.42mm)
804-8658-24	Cone, 1.36" x 1.71" (34.54 x 43.43mm)
804-8658-25	Cone, 1.71" x 2.07" (43.43 x 52.59mm)
804-8658-26	Cone, 2.07" x 2.44" (52.59 x 61.98mm)
804-8658-27	Cone, 2.44" x 2.89" (61.98 x 73.41mm)
804-8664-64	**Tapered Cone Set for 1" Arbor**
804-8664-45	Cone, 1.15"–1.80" (29.21 - 45.72mm)
101-0243-00	Cone, 1.70"–2.35" (43.18 - 59.69mm)
101-0236-05	Cone, 2.25"–2.90" (57.15 - 73.66mm)
101-0237-02	Cone, 3.35"–4.00" (85.09 - 101.6mm)
804-8664-50	Cone, 3.90"–4.55" (99.06 - 115.57mm)
	Clamp Bells
109-1011-09	4.25" (107.95 mm) O.D.
101-0235-40	5.75" (146.05 mm) O.D. (2 included)

STANDARD & OPTIONAL EQUIPMENT (continued)

Part No.	Miscellaneous Description
804-2059-20	Chip Tray
108-1061-00	Vented Silencer-Rotor
109-1032-09	Spacer, 1 x 1.5 x 1.5
804-8665-41	Solid Rotor Silencer, Magnetic Band, .250" x 48" (6.35 x 1219.2 mm)
101-0230-10	Automotive Drum Silencer
000-0600-70	Hex Key .187" (4.75 mm)
000-0600-54	Hex Key .125" (3.18 mm)
000-0600-20	Hex Key .312" (7.93 mm)
800-1017-39	Hex Key .375" (9.53 mm)
804-8664-43	Wrench, Draw Bolt
804-7803-35	Wrench, Arbor Nut

OPTIONAL ACCESSORIES

	Arbors
804-2049-41	11/16" Arbor with Nut, Cone & Washer, Bore .875"–1.250" (22.23 - 31.75 mm) 7.375" Long
804-2040-42	1" Arbor with Nut/Washer 9.75" L
804-8666-09	1 7/8" Arbor with Nut & Washer (for Ammco Adapters) 15.75" Long
804-2040-90	2" Arbor with Nut/Washer, 15.75" L
804-8677-10	Extended 2" Arbor with Nut & Washer, 19.88" Long
	Double Ended Cones used for larger hubbed Drums & Rotors
804-8665-15	Cone, 2.82" x 3.18" (73.41–82.80mm)
804-866516	Cone, 3.20" x 3.56" (82.80–91.95mm)
804-8664-65	**Light Truck Set for 1" Arbor** Bore Range 3.90"–5.65" (99.06-143.51mm) for Hubless Drums/Discs
804-8664-50	Cone, 3.90"–4.55" (99.06–115.5mm)
804-8664-50	Cone, 3.90"–4.55" (99.06–115.5mm)
804-8664-51	Cone, 4.45"–5.10" (113–129.54mm)
101-0639-00	Cone, 5.00"–5.65" (127"–143.51mm)
000-1806-70	Spring
804-2053-01	Clamp Bell, 6.25" (158.75mm)
804-2053-00	Clamp Bell, 7.75" (196.85mm)
804-8659-59	**Hubless Adapter Set, Small Size for 1" Arbor, Bore Range 1.87"–3.00" (47.5 - 76.2 mm) LH**
804-8659-60	Rotor Locator LH
804-8659-61	Cone, 1.875" x 3.125” (47.63 x 79.38mm)
804-8659-62	Spacer LH
804-8659-63	Locator Nut LH
102-0925-00	Wrench, Spanner

STANDARD & OPTIONAL EQUIPMENT (continued)

Optional Accessories

Part No.	Description
804-8626-13	**Hubless Adapter Set, Large Size for 1" Arbor, Bore Range 4.00"–5.75" (101.6-146.05 mm)**
804-2020-23	Rotor Locator
804-4161-85	Cone, 3.68" x 5.93" (93.47 x 150.62mm)
804-4161-86	Spacer
804-2020-22	Locator Nut
804-1168-49	Wrench, Spanner
804-8667-75	**Hubless / Composite Rotor Adapter Kit**
804-2010-23	Hubless Adapter Set, Std. Size
804-8631-85	Backing Plate for 804-8631-86, 804-8631-87, 804-8657-12, 804-8656-98
804-8631-86	Adapter Plate, Taurus/Sable,G.M.,“W-Body,” Lincoln
804-8631-88	Backing Plate, Chevy 1500 (for 804-8631-89)
804-8631-89	Adapter Plate, Chevy 1500
	Composite Rotor Backing Plates for 804-2010-23 Adapters
804-8631-85	Backing Plate for 804-8631-86, 804-8631-87, 804-8657-12, 804-8656-98
804-8631-86	Adapter Plate, Taurus/Sable,G.M., “W-Body,” Lincoln
804-8631-88	Backing Plate, Chevy 1500 (for 804-8631-89)
804-8631-89	Adapter Plate, Chevy 1500
804-8656-98	Adapter Plate, Jeep Cherokee
804-8657-12	Adapter Plate, Eagle Premier
804-8626-14	**Hubless Adapter Set, Large Size for 2" Arbor, Bore Range 4.00"–5.75" (101.6–146.0mm)**
804-8657-08	Rotor Locator LH
804-4161-85	Cone, 3.68" x 5.93" (93.4–150.6mm)
804-4161-86	Spacer
804-2020-22	Locator Nut LH
804-1168-49	Wrench, Spanner

STANDARD & OPTIONAL EQUIPMENT (continued)

Optional Accessories

804-8664-66	**Medium Truck Set, for 2" Arbor, Bore Range 2.15"–6.10" (54.61–154.94mm) for Hubless Drums /Discs**
804-8664-53	Cone, 2.15"–2.80" (54.6–71.1mm)
804-8664-54	Cone, 2.70"–3.35" (68.5–85.0mm)
804-8664-55	Cone, 3.25"–3.90" (82.5–99.0mm)
804-8664-56	Cone, 3.80"–4.45" (96.5–113.0mm)
804-8664-57	Cone, 4.35"–5.00" (110.4–127.9mm)
804-8664-58	Cone, 4.90"–5.55" (124.4–140.9mm)
804-8664-59	Cone, 5.45"–6.10" (138.4–154.9mm)
101-0638-01	Spring
804-8662-02	Clamp Bell, 7.75” (196.85 mm) (2 included)
804-7803-05	Spacer, 2” (50.8 mm)
804-7803-01	Spacer, 3” (76.2 mm)
804-8664-67	**Heavy Truck Set, for 2" Arbor, Bore Range 5.45"–8.30" (13.8.4–210.8mm) for Hubless Drums / Discs**
804-8664-59	Cone, 5.45"–6.10" (138.4–154.9mm)
804-8664-60	Cone, 6.00"–6.65" (152.4–168.9mm)
804-8664-61	Cone, 6.55"–7.20" (166.3–182.8mm)
804-8664-62	Cone, 7.10"–7.75" (180.3–196.8mm)
804-8664-63	Cone, 7.65"–8.30" (194.3–210.8mm)
101-0638-01	Spring
804-3000-84	Clamp Bell, 9.25" (234.95 mm) (2 included)
804-7803-05	Spacer , 2" (50.8mm)
804-7803-01	Spacer , 3" (76.2mm)
	Miscellaneous
804-8665-64	Rotor Bits, Pkg/10 (3 cutting edges) 1/32" (.79 mm) Radius
804-8665-61	Rotor Bits, Pkg/10 (3 cutting edges) 1/64" (.4 mm) Radius
804-8665-62	Drum Bits, Pkg/10 (2 cutting edges)
804-7803-18	Solid Carbide Bit, .375" (9.53 mm) Shank
804-1408-22	Heavy Duty Tool Holder & Bit
804-1290-05	Tool Bit for 804-1408-22
101-0230-10	Automotive Drum Silencer
108-1062-00	Vented Rotor Silencer
804-8665-42	Truck Drum Silencer, 2.75" (69.85 mm) wide
804-8665-41	Solid Rotor Silencer Magnetic Band, .25" x 4" (6.35 x 101.6 mm)
804-8665-43	Brake Drum Wear Limit Gage, Range 6"–22" (152.4-558.8 mm)
804-8665-44	Rotor Micrometer, Range .30"–1.30" (7.62-33.02 mm)
804-8668-08	Disc Rotor Swirl Finisher, Non-Directional
804-8668-09	Replacement Pads, 25, 80 Grit
804-8668-10	Replacement Pads, 25, 120 Grit
804-2049-60	Drum Grinder for 204C,115V, 50 / 60 Hz, 1 Ph
804-2049-69	T-Bar Holder
804-3029-49	Tool Bar Extension, Small Drum Adapter
804-8665-45	Safety Shield

OPERATION

SPEEDS

1. Spindle speeds are 60, 100, and 170 RPM. To change RPM loosen thumb screw (Figure 4 A & B). To remove belt guard (machine must be off) loosen wing nut (Figure 4C), lift motor to free belt and put belt in proper groove. Replace motor and tighten with medium tension on belt, replace belt guard. A larger diameter drum or rotor requires a lower RPM. For most applications, Van Norman recommends the middle pulley groove for passenger cars and light truck brake drums and rotors. The outer pulley groove is for extremely small rotors and drums and the inner pulley groove for very large drums and rotors.

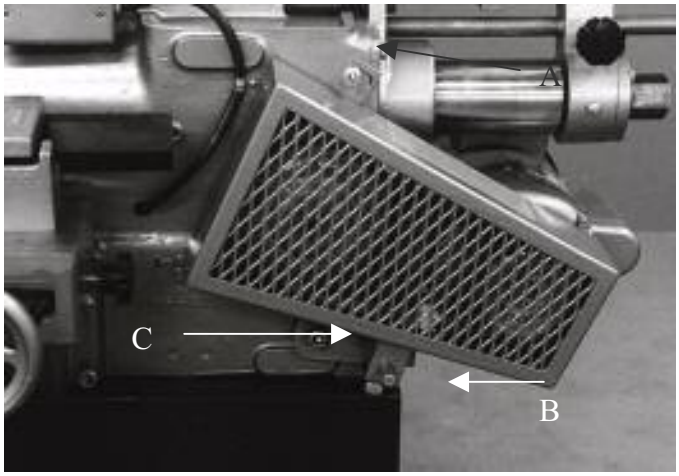


Figure 4

FEED SLIDE

1. Feeds per revolution are 0 to .020". Feed per revolution should be as high as possible for most profitable operation. Drums require a good finish. A setting of .020" is used for rough cuts.
2. A large diameter drum or rotor requires a higher feed.
3. To change speeds loosen knob (Figure 5A) and move handle (Figure 5B), to desired speed and lock knob.

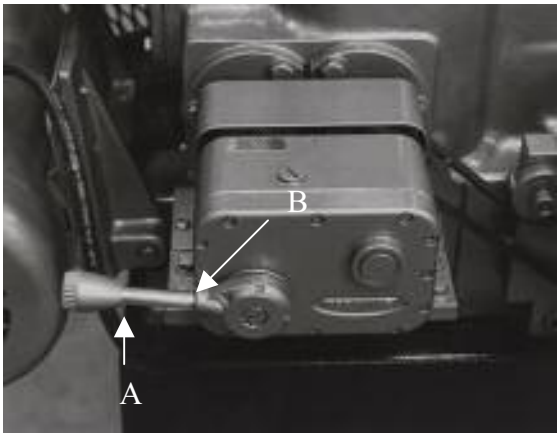


Figure 5

OPERATION (continued)

CHATTER CONTROL

1. Brake drums are dish or bell shaped and have a tendency to chatter. This can result in a wavy or chatter finish accompanied by excessive noise. **THE VIBRATION DAMPENER BELT MUST BE USED AT ALL TIMES** to prevent chatter. Securely wrap belt around the outside of the drum or use proper "O" ring type on outside of a rotor.
2. Dull, broken chipped or improper tool bits will cause chatter. ALWAYS use tool bits supplied by the original manufacturer as they are designed to do a specific job.
3. A loose carbide tip on the tool holder will cause chatter. Make sure screw holding carbide tip grips tip firmly.
4. A dirty uneven surface will crack the carbide tip and/or chatter.

TOOL BITS

1. This lathe is supplied with replaceable type throw-away carbide tips, part no. 804-8665-62 (Figure 6) for the drum cutters and part no. 804-8665-61 for the rotor cutters, (Figure 7).

Figure 6

Figure 7

INSTALLATION OF ARBOR

1. Select correct size mandrel for the work to be done, either a 1" diameter for work that is 150 pounds or less or the heavy-duty 2" mandrel for work 150 to 500 pounds.
2. Slide mandrel into spindle taper.

IMPORTANT: Both mandrel and spindle tapers must be clean or else mandrel will run out and taper may be damaged. Align pin in mandrel with slot in main spindle. Screw in draw bar (Figure 8A), and lock tightly. DO NOT tighten excessively. Driver pin will prevent arbor from slipping. Remove mandrel easily (Mandrel has non-locking taper) by loosening nut then tapping lightly into the draw bar.

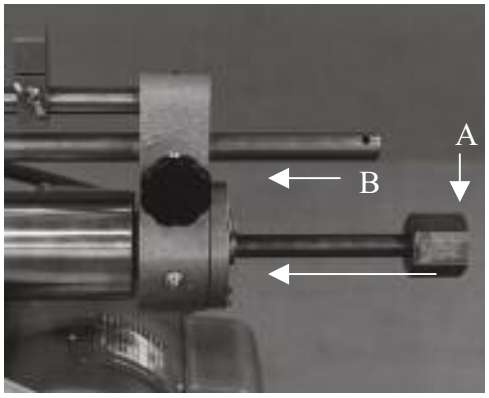


Figure 8

OPERATION (continued)

RECONDITIONING DRUMS

1. The knob (Figure 8B) should be loosened when turning drums to insure spindle will move out during operation. This screw must be tightened when cutting rotors.
2. This knob (Figure 9) should be tightened when doing drums and slide is in position. Loosen when cutting rotors.

Figure 9

3. To engage feed of main spindle push lever (Figure 10A), to the right of handwheel (Figure 10B), is the main control to move the main spindle “in” or “out”.

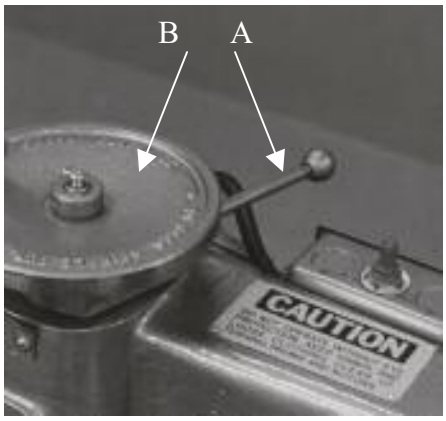


Figure 10

4. Crank (Figure 11) is used for moving the tool bit into the brake drum on the 204S. This crank is graduated into thousandths and is direct reading. Example: If crank is moved out .030", drum will be enlarged .030".

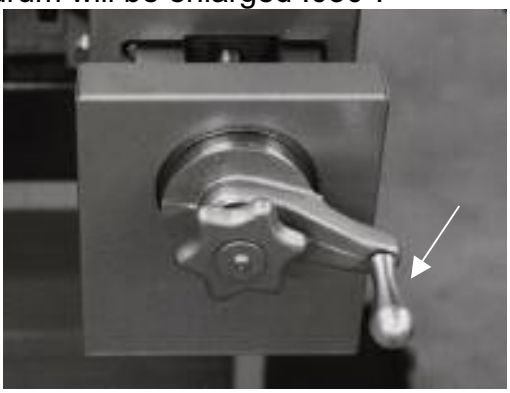


Figure 11

OPERATION (continued)

5. To disengage feed loosen wing nut (Figure 12A) and slide stop (Figure 12B) to desired position.

6. Reset stop (Figure 12B) every time machine is used on a different width drum. If properly set, the machine will disengage automatically when it reaches the stop.

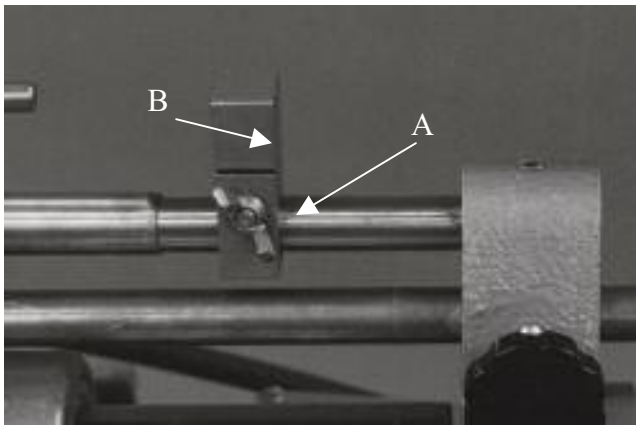


Figure 12

7. Measure the diameter of the drum with a micrometer to determine that the drum will be within maximum reboring limits after reconditioning. It should also be in good general condition.

8. Set the spindle speed to match the drum size (Figure 4, Page 12). Move the V-belt on the pulley to the correct groove.

9. Mount the drum on the arbor using the proper adapters, cones and spacers (Figure 13).

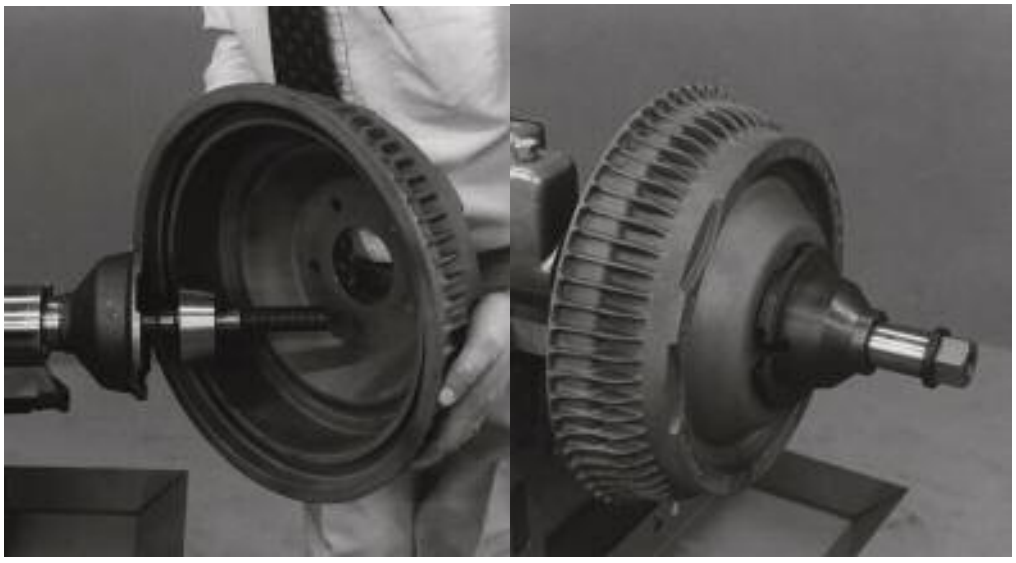


Figure 13

OPERATION (continued)

10. Wrap and secure the drum silencer band tightly around the drum (Figure 14).
11. Turn the cross feed handwheel and the spindle feed handwheel to their maximum clockwise position. Then back off the cross feed handwheel 2 turns and the spindle feed handwheel 4 turns.
12. Position the tool bar by loosening the tool bar clamp nut (Figure 14 & 15) and sliding the tool bar inward toward the drum until the tool bit is close to the surface that is going to be machined. The entire tool bar may also be swiveled to achieve the best cutting position.

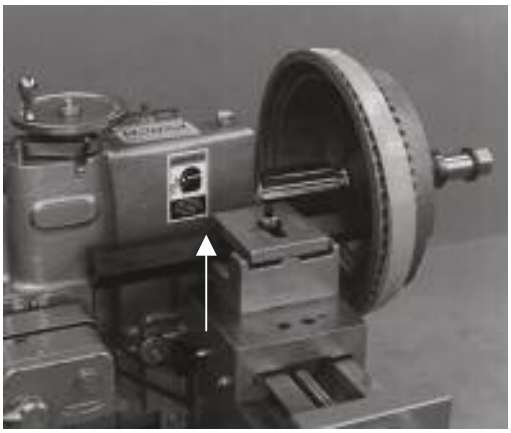


Figure 14

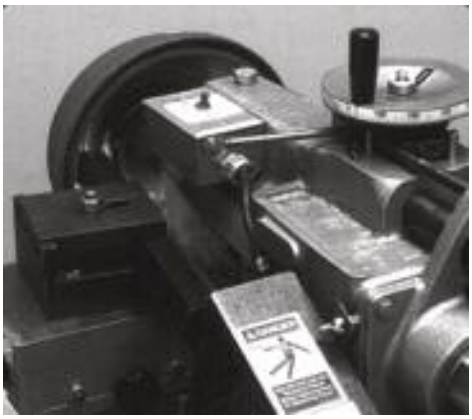


Figure 15

13. Turn the drum by hand to be sure that it runs true. Turn the lathe on and advance the tool bit manually until it just contacts the drum surface and makes a scratch cut. Back the tool bit off, stop the lathe. Loosen the arbor nut and rotate the drum one-half turn. Retighten the nut, turn the lathe on and make a second scratch cut, stop the lathe. If the first and second scratch cuts are opposite one another (180° apart) remove the drum from the arbor. Check the mounting adapters and the arbor for nicks, burrs or chips. Clean if necessary. If the scratches are side by side, proceed turning the drum.
14. Turn the spindle feed handwheel until the deepest worn groove of the drum is opposite the point of the tool bit. Advance the tool bit into the bottom of the groove by rotating the tool bit into the bottom of the groove by rotating the cross feed handwheel counter-clockwise.
15. The depth of cut dial will show the approximate reconditioned diameter of the drum. Make sure that the resurfaced drum will be within the limits cast into the drum.
16. Roughing cuts should be no deeper than .010” (.25mm): finish cuts no shallower than .002” (.05mm). Usually no more than 2 cuts are required to resurface a drum. With the lathe running, set the depth of cut, dial to the desired depth and lock the cross slide by tightening the cross slide locking knob.

OPERATION (continued)

TURNING DISC BRAKES

1. Tighten thumb screw (Figure 8 B Page 13)
2. Loosen knob (Figure 9 Page 14)
3. Each brake disc should be carefully inspected for scoring, rust, ridges (at the inner and outer circumference of the rotor) and hard spots. Any excessive wear or deformity should be noted and, if not within acceptable limits, the rotor should be replaced. Using a micrometer check the thickness of the rotor in at least three points around the circumference about 1" (2.54 cm) in from the outer diameter. If the rotor thickness varies between readings it should be machined. However, if the thickness is less than the minimum established by the manufacturer or it will be after resurfacing, the rotor should be replaced. NOTE: The minimum refinished thickness dimension is cast into the rotor.
4. Mount the rotor on the arbor (Figure 16) note that the rotor is centered from hub with two cones on the Timken bearings. (Figure 16) shows a disc set-up with the hubless adapter. Install the silencer band, this is easily done by stretching the band around the outside of the rotor (Figure 17).

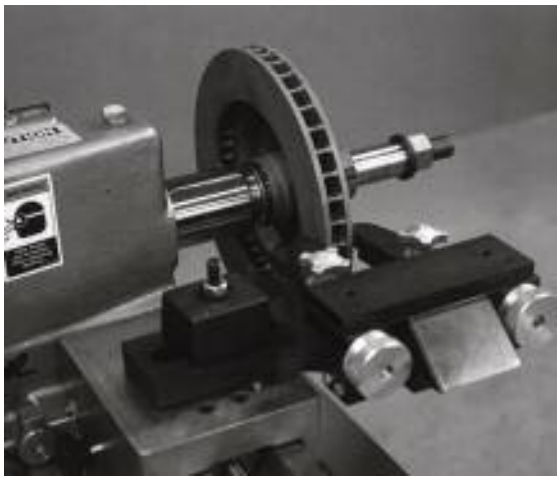


Figure 16

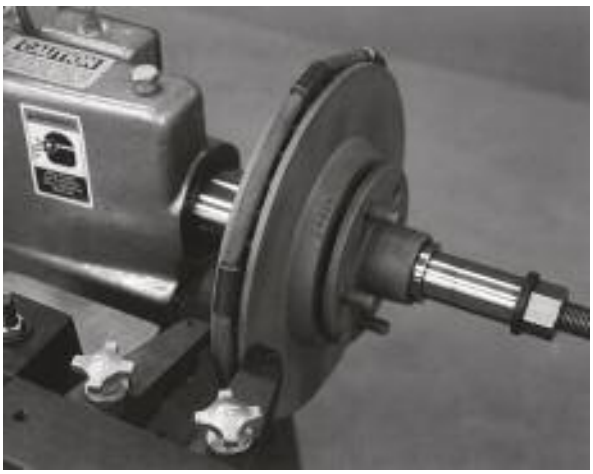


Figure 17

5. Adjust pulley drive belts for the desired speed (Page 12).

OPERATION (continued)

6. Feed in the slide assembly with crank [Figure 18 A). (Figure 18 B) Locking nut is turned in to engage slide power. (Must be loose to turn slide in or out manually.

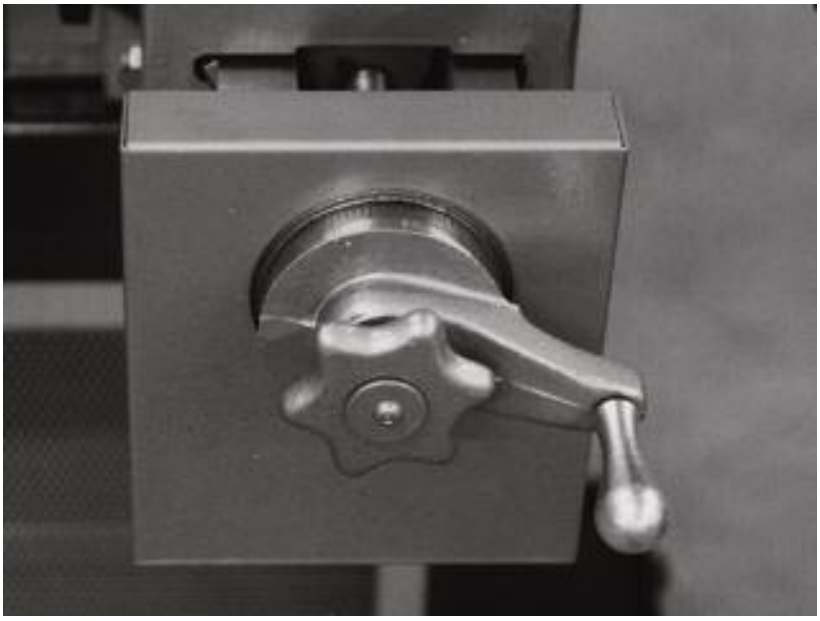


Figure 18

7. Feed in the moveable claw with graduated dial [Figure 18 A) until there is slight contact with disc brake pad surface. Tightly lock the moveable claw with binder [Figure 18 B). Turn the cross feed handle to move the tool bits all the way in and off the disc pad surface. Determine amount of stock to be removed to clean up both disc brake pad surfaces. NOTE: Maximum cut per side is .015". Engage feed by tightening knob. Use a slow cross feed of approximately .004" per revolution (zero max control).

8. After facing the surface a non-directional finish should be applied.

MAINTENANCE

STORAGE

If machine is to be stored for a long period of time, the following should be done:

1. Unplug machine, turn the slide into machine base and lock back spindle thumb screw to keep spindle in position.
2. Take tension off all drive belts.
3. Spray machine with a rust inhibiting oil and cover machine to protect it from dust and dirt.

MAINTENANCE (continued)

DISASSEMBLY, REPAIR, REPLACEMENT AND REASSEMBLY

1. Unplug machine.
2. Remove tooling from machine.
3. Remove arbor by loosening draw bar.
4. Drain oil.
5. You are now ready to start repair.

SPINDLE BEARING

NOTE: It is rare for the spindle bearing to need replacement.

1. Check that items 1-5 above have been completed.
2. Remove belt guard.
3. Loosen wing nut (Page 30, Item 14) to allow motor to lift up to remove belt (Item 12).
4. Punch out groove pin (Page 26, Item 2) remove oiler (Item 4), then lift out handwheel assembly.
5. Loosen screws (Page 28, Item 12), (Page 12, Item 34).
6. Pull back on bearing housing (Page 19, Item 11), turn side ways, pull shaft (Item 28) removing (Items 29, 30, and 31).
7. Remove washer (Item 4) and bolt (Item 23), hold bearing housing (Item 11) and spindle, and remove from machine.
8. Now remove and replace spindle bearing (Page 17, Item 3).
9. Reverse above for assembly.
10. Always replace front and rear seals, Part No. 804-1415-69.

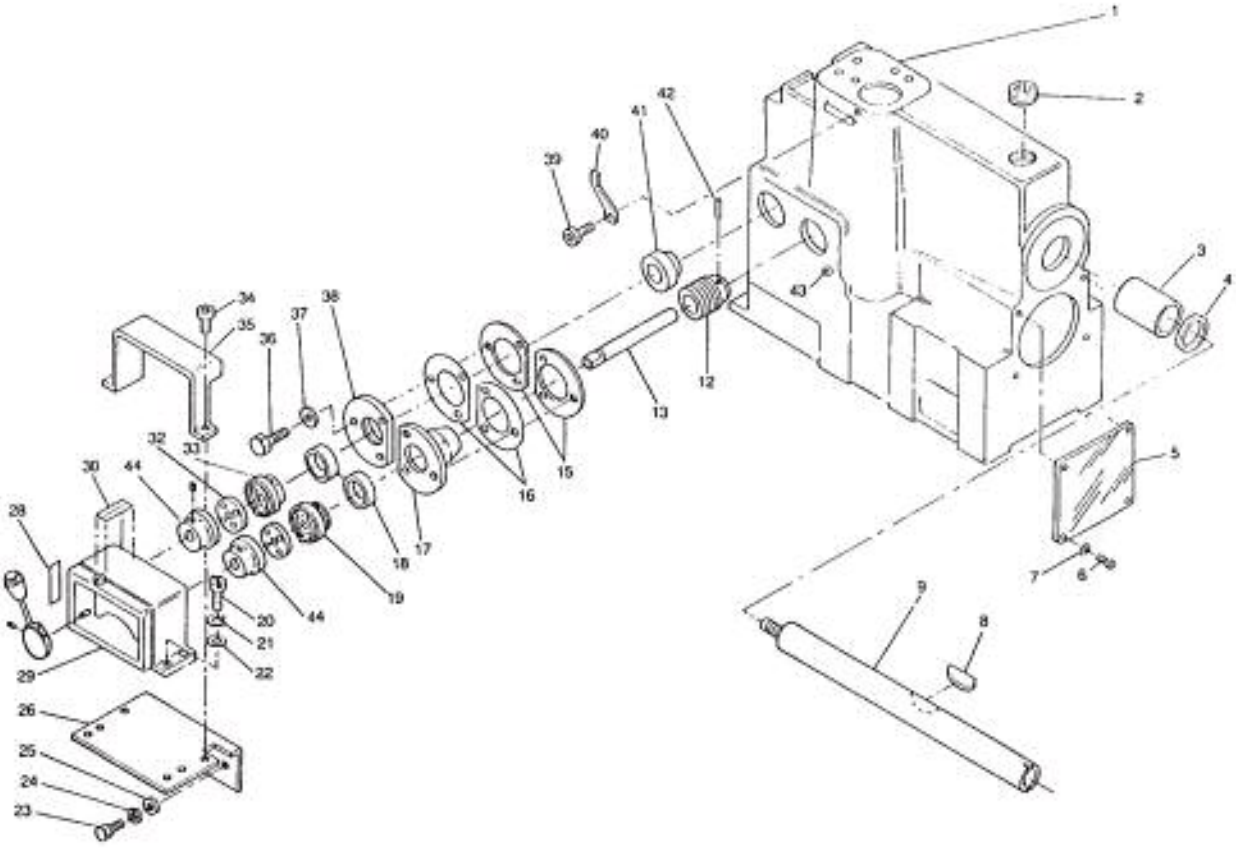
REPLACE ZERO MAX SIDE SEALS Worm Shaft & Output Shaft Seals (Page 17)

1. Remove the two screws (Item 23) and lift zero max off machine.
2. Remove couplings (Item 19 & 33), remove seals and replace them. Reassemble.

REPLACE FRONT BEARING OIL SEAL (Page 17, Item 4)

1. Crank spindle back to farthest position.
2. Pull seal out and press new seal in.

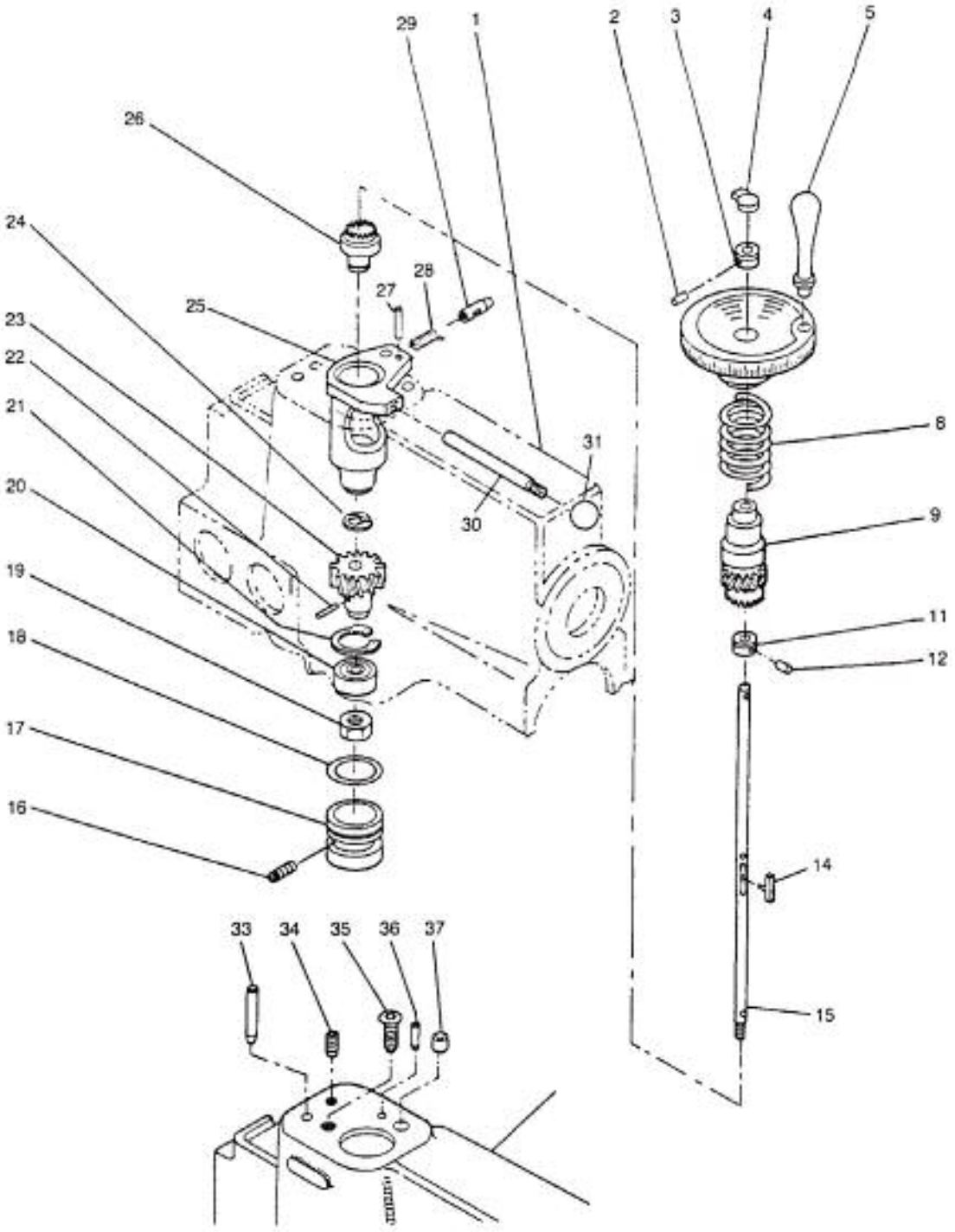
BASIC MACHINE



BASIC MACHINE

Item	Part No.	Description	Qty
1	804-2043-00	Body	1
2	804-1184-28	Breather	1
	804-3020-06	Bearing (Prior to 1984)(Not Shown)	
4	804-1415-69	Front Bearing Oil Seal	1
5	804-3040-65	Work Light Window	1
6	804-1050-21	Screw (10-32 x 3/8)	4
7	000-1154-60	Washer (#10)	4
8	804-3040-10	Spindle Key	1
9	804-2040-03	Spindle	1
12	804-2040-13	Output Shaft Spiral Gear	1
13	804-2040-12	Shaft	1
15	804-2040-97	Shim Pack (.015)	2
16	804-2040-10	Shim Pack (.005)	2
17	804-2040-39	Cap	1
18	804-1077-11	Oil Seal	2
19	804-2041-20	Coupling (Mach)	1
20	000-0165-27	Head Cap Screw 1/4 X 20 X .625)	4
21	000-1180-10	Lockwasher (1/4”)	4
22	000-1150-10	Washer 1/4" Flat	4
23	000-0102-86	Head Cap Screw (5/16-18 x 3/4)	2
24	000-1180-28	Lockwasher (5/16)	2
25	000-1160-17	Washer, 5/16 Flat	2
26	804-2048-21	Zero Max Support Bracket	1
28	804-2040-94	Decal	1
29	804-2043-17	Zero Max Assembly	1
30	804-2040-93	Decal	1
32	804-1252-66	Disc Coupling #FD-20	2
33	804-1243-49	Coupling #FC-20 x.75	1
34	000-0592-22	BHCS (1/4 - 20 x .375)	2
35	804-2040-61	Zero Max Coupling Guard	1
36	000-0102-86	HHCS (5/16 - 18 x 3/4)	6
37	000-1160-17	Washer 5/16 Flat	6
38	804-2040-09	Worm Bearing Cap	1
39	804-1050-21	Screw (10-32 x 3/8)	1
40	804-2041-63	Pointer	1
41	804-1243-47	Roller Bearing	1
42	804-1115-58	Groove Pin (3/16 x 1 1/4)	1
43	804-1235-50	SSS (1/2-20 x 1)	4
44	804-8656-94	Coupling #FC-20 x .375	2
45	804-8043-17	Zero Max Handle Assembly	1

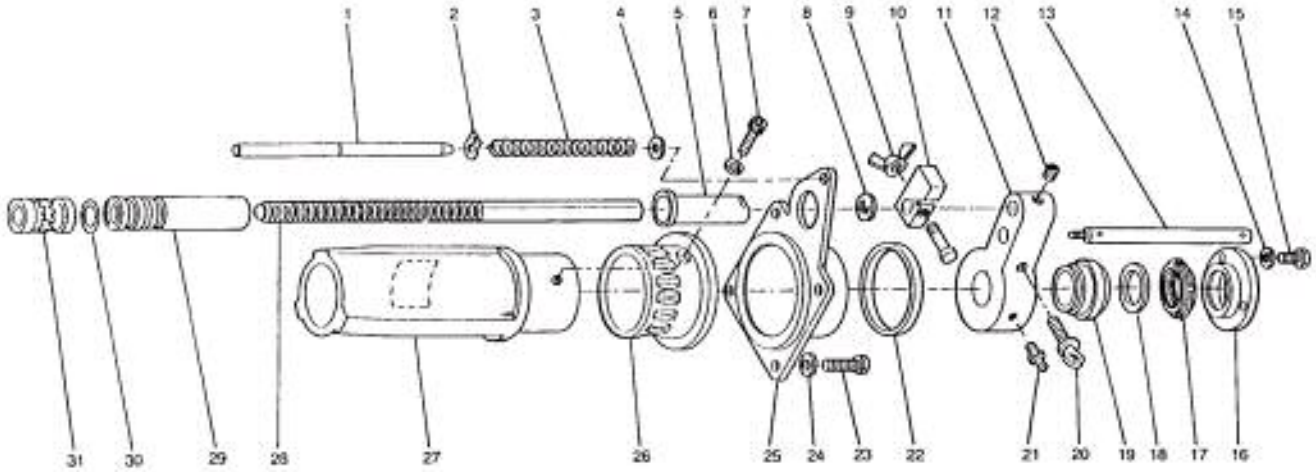
VERTICAL SHAFT ASSEMBLY



VERTICAL SHAFT ASSEMBLY

Item	Part No.	Description	Qty.
1	804-2043-00	Body	1
2	804-1094-24	Groove Pin	1
3	804-2040-19	Upper Collar	1
4	804-1062-54	Oiler	1
5	000-4400-10	Handwheel Handle	1
7	804-2040-75	Vertical Shaft Handwheel	1
8	804-2040-18	Handwheel Spring	1
9	804-2040-76	Gear	1
11	804-2040-19	Lower Collar	1
12	804-1094-24	Groove Pin	1
14	804-1071-80	Pilot Key	1
15	804-2040-14	Shaft	1
16	804-1235-50	SSS 1/2-20 x 1	1
17	804-2040-16	Ball Bearing Housing	1
18	804-1243-48	O-Ring	1
19	000-1035-51	Hex Nut (1/2-20)	1
20	804-1243-51	Ball Bearing	1
21	804-1243-52	Retaining Ring	1
22	804-1094-24	Groove Pin	1
23	804-2040-15	Vertical Shaft Helical Gear	1
24	804-1160-74	Retaining Ring	1
25	804-2040-21	Feed Clutch Hub Assembly	1
26	804-2040-20	Vertical Shaft Clutch	1
27	000-7204-96	Spiral Pin	1
28	804-1243-94	Compression Spring	1
29	804-2040-40	Hub Detent	1
30	804-2040-22	Clutch Lever	1
31	804-1243-53	Lever Ball	1
33	804-8035-72	Dowel Pin, 3/8 x 2	1
34	804-1240-25	SSS (3/8-24 x 1/2)	1
35	804-8016-58	Button Soc. Head Screw, 3/8-24 x 1	1
36	000-7000-37	Dowel Pin (1/4 x 1 1/4)	1
37	804-1166-25	Oiler	1

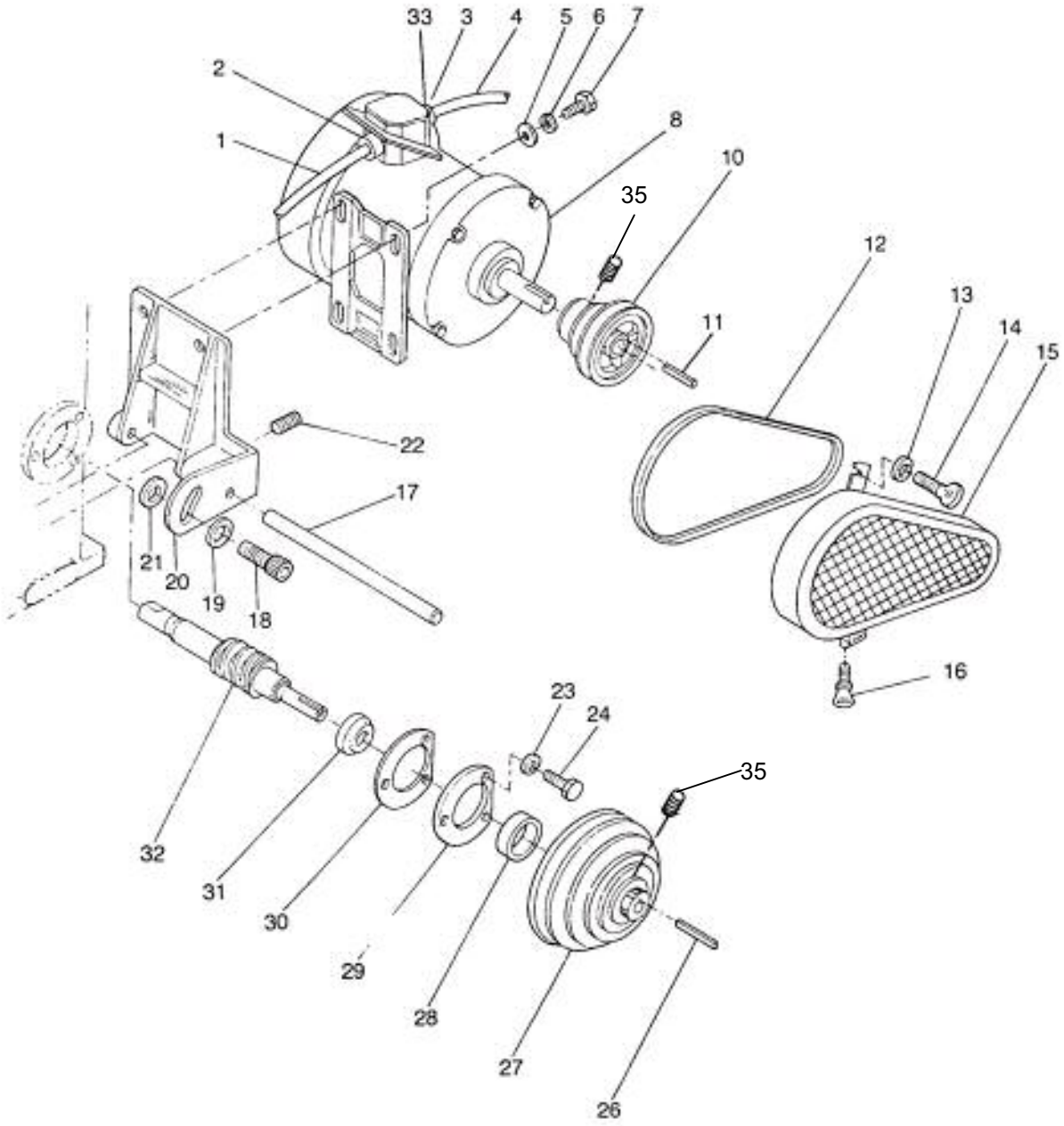
SPINDLE CLAMP ASSEMBLY



SPINDLE CLAMP ASSEMBLY

Item	Part No.	Description	Qty.
1	804-2040-26	Push Rod	1
2	804-8035-81	Retaining Ring	1
3	804-1243-55	Compression Spring	1
4	000-1155-33	Washer, 3/8 Flat	1
5	804-2040-63	Sleeve	1
6	000-1180-28	Lockwasher, (5/16)	3
7	000-0167-64	SHCS (5/16-18 x 1/2)	3
8	804-1247-55	Retaining Ring (5000-112)	1
9	804-8073-76	Wing Nut (5/16-18	1
10	804-2040-27	Release Dog Assembly	1
11	804-2042-97	Bearing Housing	1
12	804-1176-62	SSS (3/8-16 x 1/2)	1
13	804-2041-51	Shaft	1
14	000-1150-10	Washer, 1/4 Flat	3
15	000-0100-57	HHCS (1/4-20 x 1)	3
16	804-2042-98	Cover	1
17	804-8641-77	Bearing Locknut	1
18	804-1405-72	Thrust Washer	1
19	804-1243-45	Roller Bearing	1
20	800-1408-51	Thumb Screw (3/8-16 x 3/4)	1
21	800-8016-56	Grease Fitting	1
22	804-1415-69	Oil Seal	1
23	000-0102-86	HHCS (5/16-18 x 3/4)	4
24	000-1160-17	Washer, 5/16 Flat	4
25	804-2040-72	Rear Bearing	1
26	804-2040-70	Spindle Worm Gear	1
27	804-2040-69	Work Spindle Sleeve	1
28	804-2040-23	Feed Screw	1
29	804-2040-62	Guard	1
30	804-1162-07	O-Ring	1
31	804-2040-24	Feed Screw Nut & Gear	1

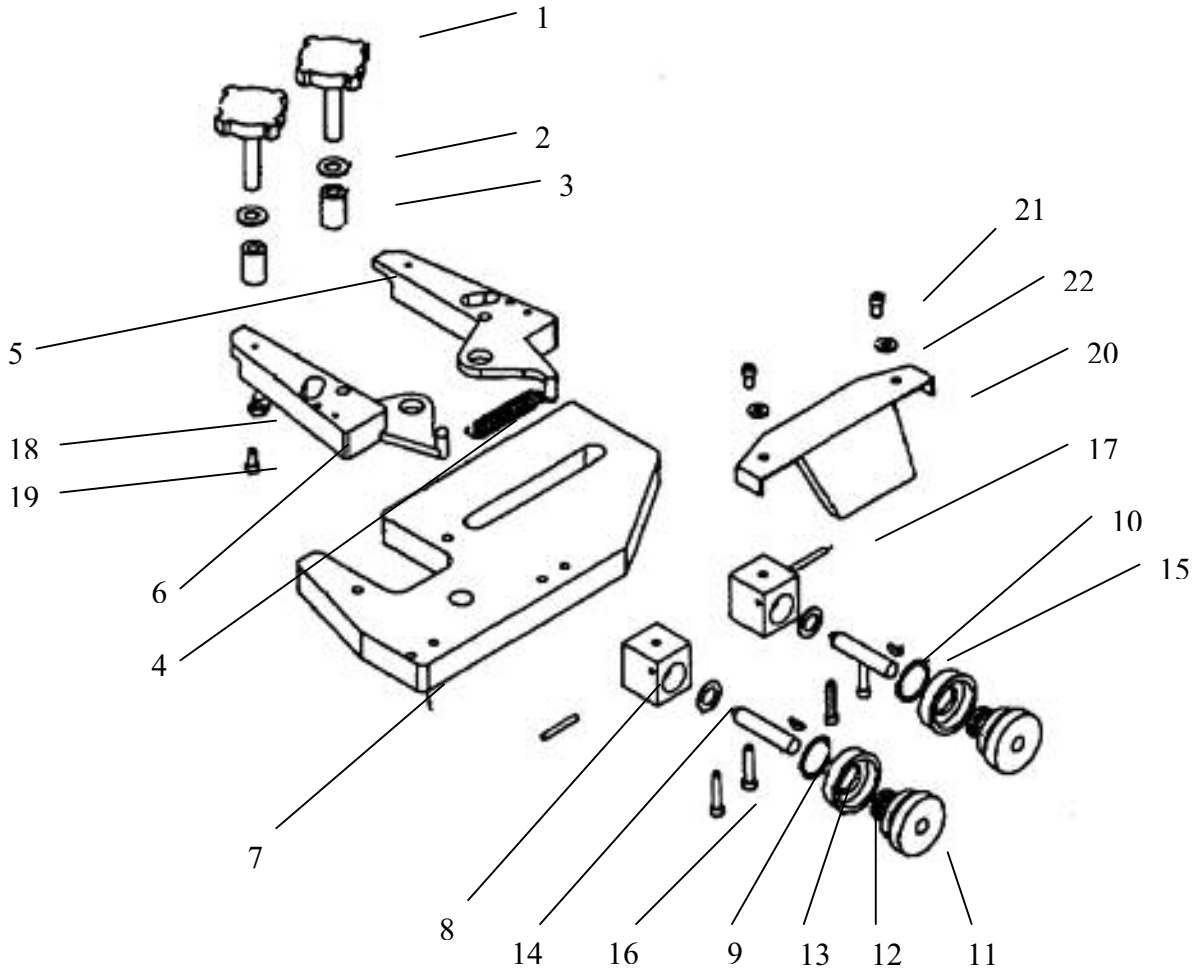
RIGHT REAR OF MACHINE



RIGHT REAR OF MACHINE

Item	Part No.	Description	Qty.
1	Bulk	Cable, 36"'	1
2	800-8014-71	Strain Relief	2
4	000-1261-01	110V Motor Cable	1
5	000-1160-17	Washer, (5/16)	4
6	000-1180-28	Lockwasher (5/16)	4
7	000-0102-86	HHCS (5/16-18 x 3/4)	4
8	804-1405-24	Motor	1
10	804-8682-62	Pulley	1
11	804-1125-05	Key	1
12	804-8676-69	Poly-V Belt	1
13	000-1160-17	Washer (5/16)	1
14	804-8073-76	Wingnut (5/16-18 x 1/2)	1
15	804-2043-24	Motor Belt Guard	1
16	804-1417-83	Thumbscrew (5/16-18 x 1/2)	1
17	804-2040-37	Pin	1
18	000-0173-02	SHCS (1/2-13 x 1)	1
19	000-1155-50	Washer (1/2, Flat)	1
20	804-2040-36	Motor Bracket	1
21	000-1155-50	Washer (1/2, Flat)	1
22	804-1069-77	SSS 5/16-18 x 1	1
23	000-1160-17	Washer (5/16)	3
26	804-1125-05	Key	1
27	804-8682-63	Pulley	1
28	804-1077-11	Seal	1
29	804-2040-09	Worm Bearing Cap	1
30	804-2040-10	Shim	1
31	804-1243-47	Roller Bearing	1
32	804-2040-71	Shaft	1
33	800-8014-74	Tiger Grip Nut	2
34	804-1069-77	Stud	1
35	000-0485-26	¼ x 20 x 3/8 Set Screw	2

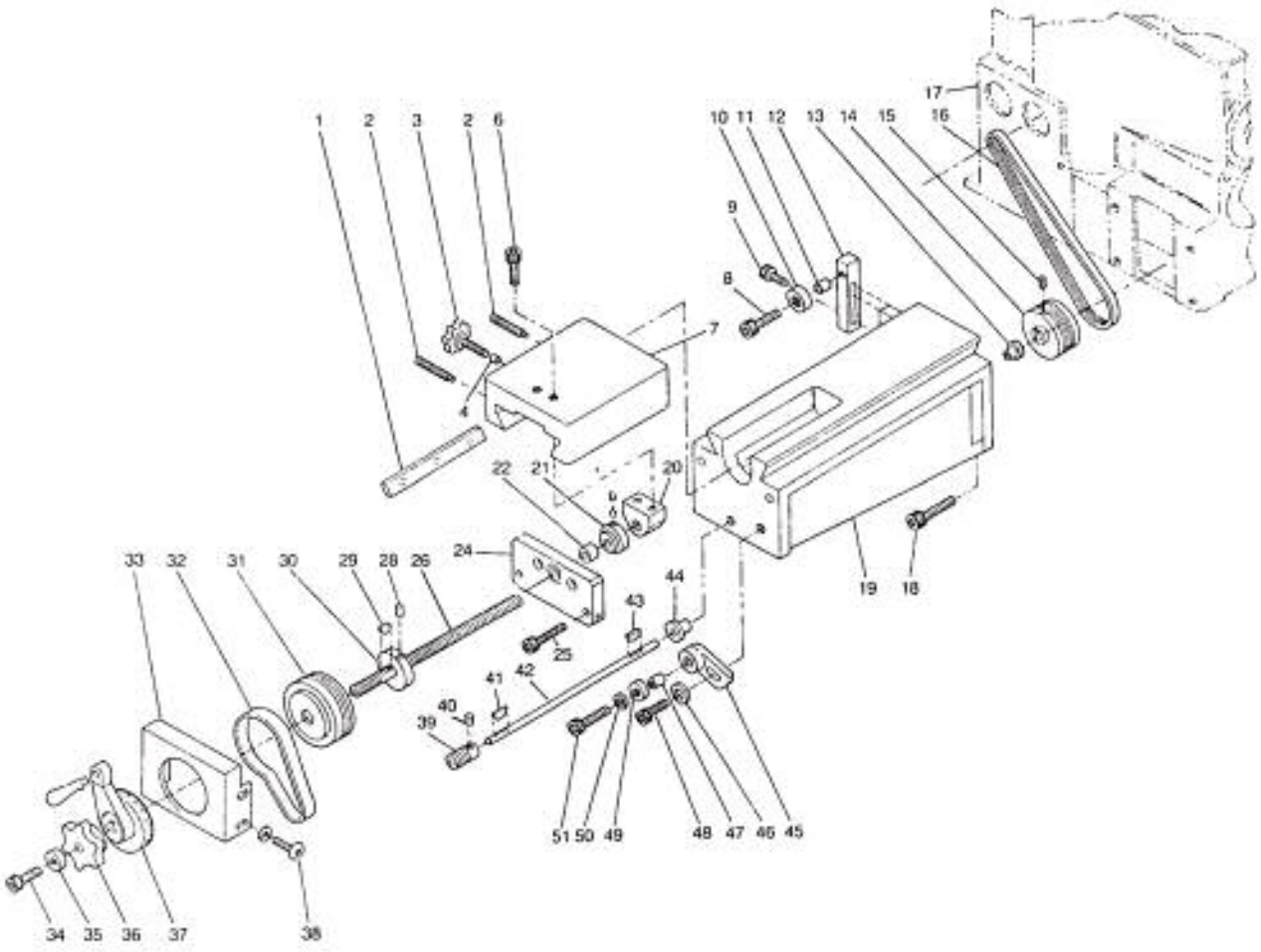
804-8690-56 DISC ASSEMBLY



804-8690-56 DISC ASSEMBLY

Item	Part No.	Description	Qty.
1	804-8693-77	Hand Lock Down	2
2	804-1407-54	Washer, .312 Flat	2
3	804-1258-12	Dowel Pin (.75 x 2)	2
4	804-1405-35	Spring	1
5	804-8678-54	R.H. Tool Holder	1
6	804-8678-55	L.H. Tool Holder	1
7	804-8690-23	Base Plate	1
8	804-8690-24	Feed Dial Block	2
9	804-2042-70	Feed Screw	2
10	000-7300-41	#5 Woodruff Key	2
11	804-8689-51	Micrometer Knob	2
12	804-8689-52	Zeroing Sleeve	2
13	804-8659-49	Zeroing Decal	2
14	804-1258-10	Finger Spring Washer	2
15	804-8689-78	Spring Washer	2
16	000-0166-08	SHCS 1/4-20 x 1.0	4
17	804-1199-25	Dowel Pin 3/16 x 1.5	2
18	804-1292-79	Clamp with Spring	2
19	000-0165-27	Clamp Screw	2
20	804-2043-20	Guard	1
21	000-0165-27	SHCS 1/4-20 x .62	2
22	800-8684-34	Rubber Seal Washer	4

POWER FEED ATTACHMENT FOR FACING DISC BRAKES

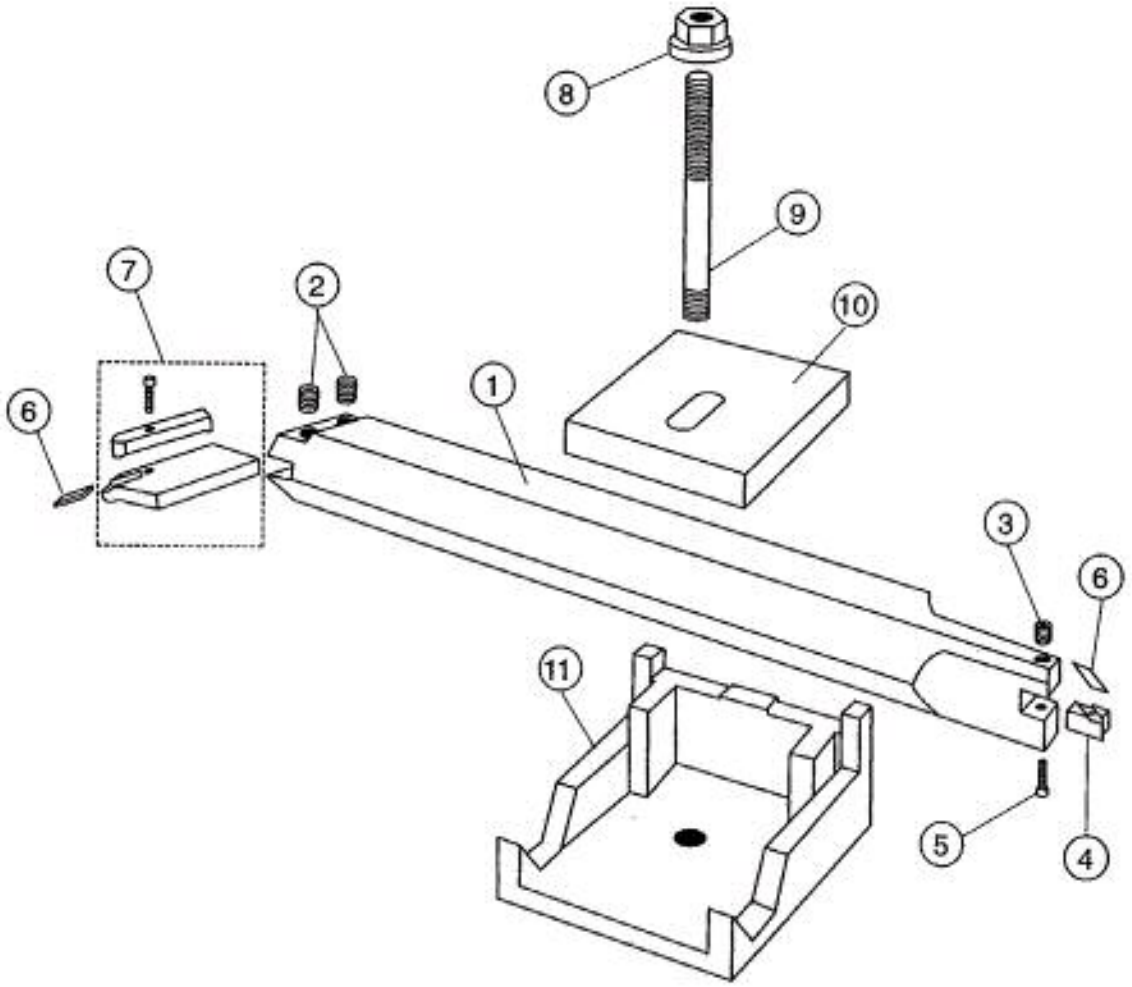


POWER FEED ATTACHMENT FOR FACING DISC BRAKES

Item	Part No.	Description	Qty.
1	804-2041-42	Gib	1
2	000-0491-23	SSS (3/8-16 x 1 3/4)	2
3	804-1405-31	Knob	1
4	804-1116-33	Brass Plug	1
6	000-0170-35	SHCS (3/8-16 x 1 1/2)	2
7	804-2041-18	Power Facing Feed Slide	1
8	000-0170-27	SHCS (3/8-16 x 1)	1
9	000-0168-02	SHCS (5/16-18 x 1)	2
10	804-2041-62	Belt Idler	1
11	804-1087-11	Oilite Bushing	1
12	804-2041-65	Idler Bracket	1
13	804-1258-36	Oilite Bushing	1
14	804-2041-26	Pulley	1
15	000-0482-91	SSS (10-32 x 1/2)	1
16	804-1405-83	Belt	1
17	804-2043-00	Body (Mach.)	1
18	000-0173-02	SHCS (1/2-13 x 1)	4
19	804-2041-17	Power Facing Feed Knee	1
20	804-2041-22	Slide Feed Screw Nut	1
21	804-2041-30	Collar	1
22	804-1111-39	Oilite Bushing	1
24	804-2041-31	Plate	1
25	000-0170-27	SHCS (3/8-16 x 1)	4
26*	804-2041-23	Feed Screw	1
27	804-8659-73	Feed Screw Assembly	1
28	794-1099-25	Pin (1/4 x 2)	1
29	804-1100-49	Woodruff Key	1
30	804-2041-32	Collar	1
32	804-1250-52	Belt	1
33	804-2041-67	Pulley Guard	1
34	000-0595-28	Screw (10-32 x 3/8)	1
35	804-2041-44	Stop Nut	1
36	804-2041-59	Power Feed Screw Drive Nut	1
37	804-2041-36	Feed Screw Crank Assembly	1
38	800-8047-64	BHCS (10-32 x 3/8)	4
39	804-2041-29	Pulley	1
40	804-1115-39	SSS (10-32 x 3/8)	1
41	804-1051-33	Woodruff Key (#3)	1
42	804-2041-28	Drive Shaft	1
43	804-1051-33	Woodruff Key (#3)	1
44	804-7258-36	Oilite Bushing	1
45	804-2042-46	Idler Arm	1
46	000-1155-33	Washer (.375 Flat)	1
47	804-1087-11	Oilite Bushing	1
48	000-0170-27	SHCS (3/8-16 x x1)	1
49	804-2041-62	Belt Idler	1
50	000-1155-33	Washer (.375 Flat)	1
51	000-0170-27	SHCS (3/8-16 x 1)	1

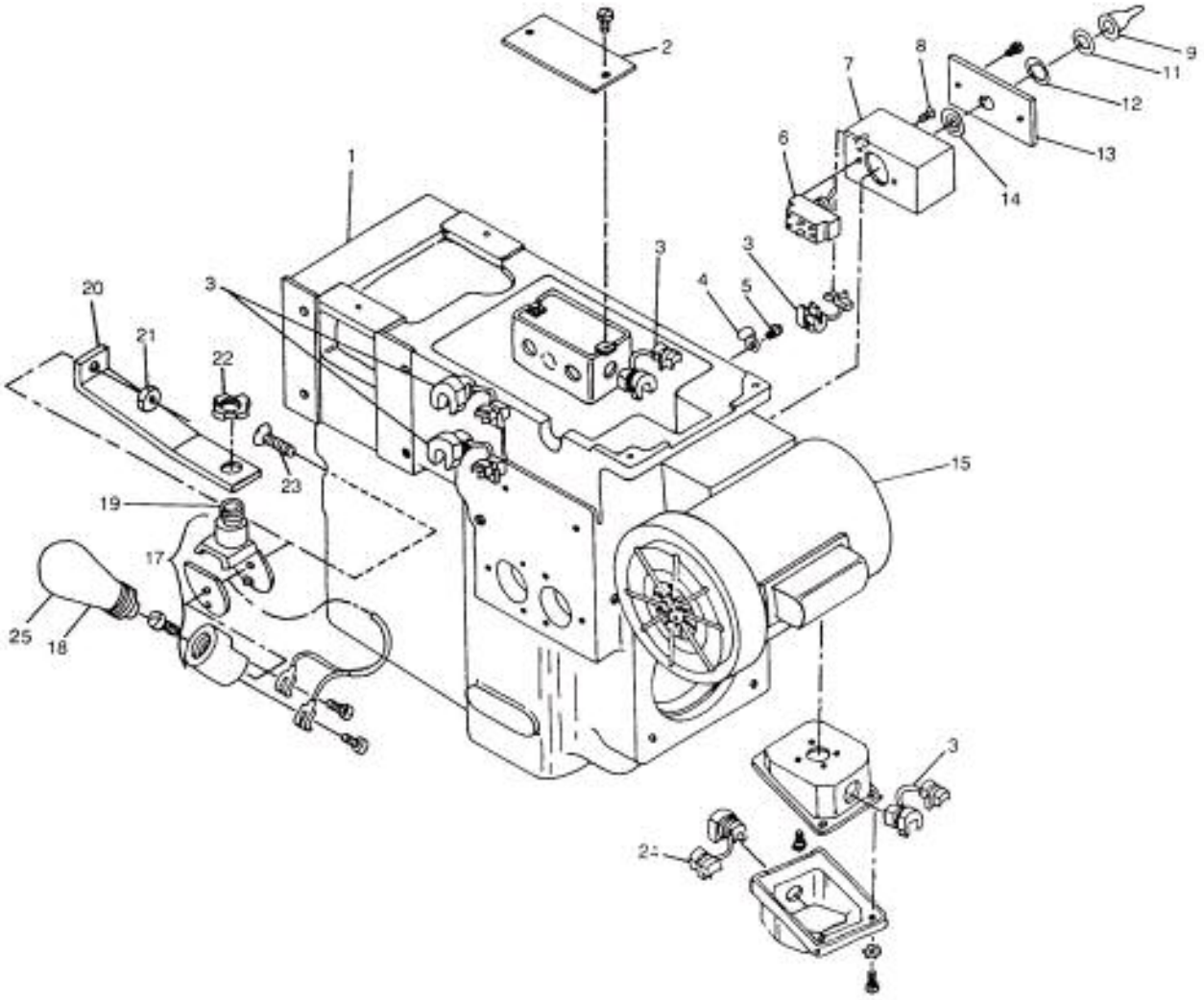
* for customer orders, use 804-8659-73

TOOL BAR ASSEMBLY



Item	Part No.	Description	Qty.
1	804-8668-06	Drum Bar	1
2	000-0505-20	SSS .375-16 x .500	2
3	804-8030-07	SS .312-24 x .375	1
4	804-8668-07	Tool Bit Holder	1
5	000-0160-14	SHCS 8-32 x .625	1
6	804-8665-52	Drum Tool Bit Package of 10	1
7	804-3021-71	Tool Bit Holder Assembly	1
8	804-8664-42	Flange Nut	1
9	804-2043-03	Drum Bar Clamp Stud	1
10	804-2040-30	Drum Bar Clamp Plate	1
11	804-2043-01	Drum Bar Holder	1

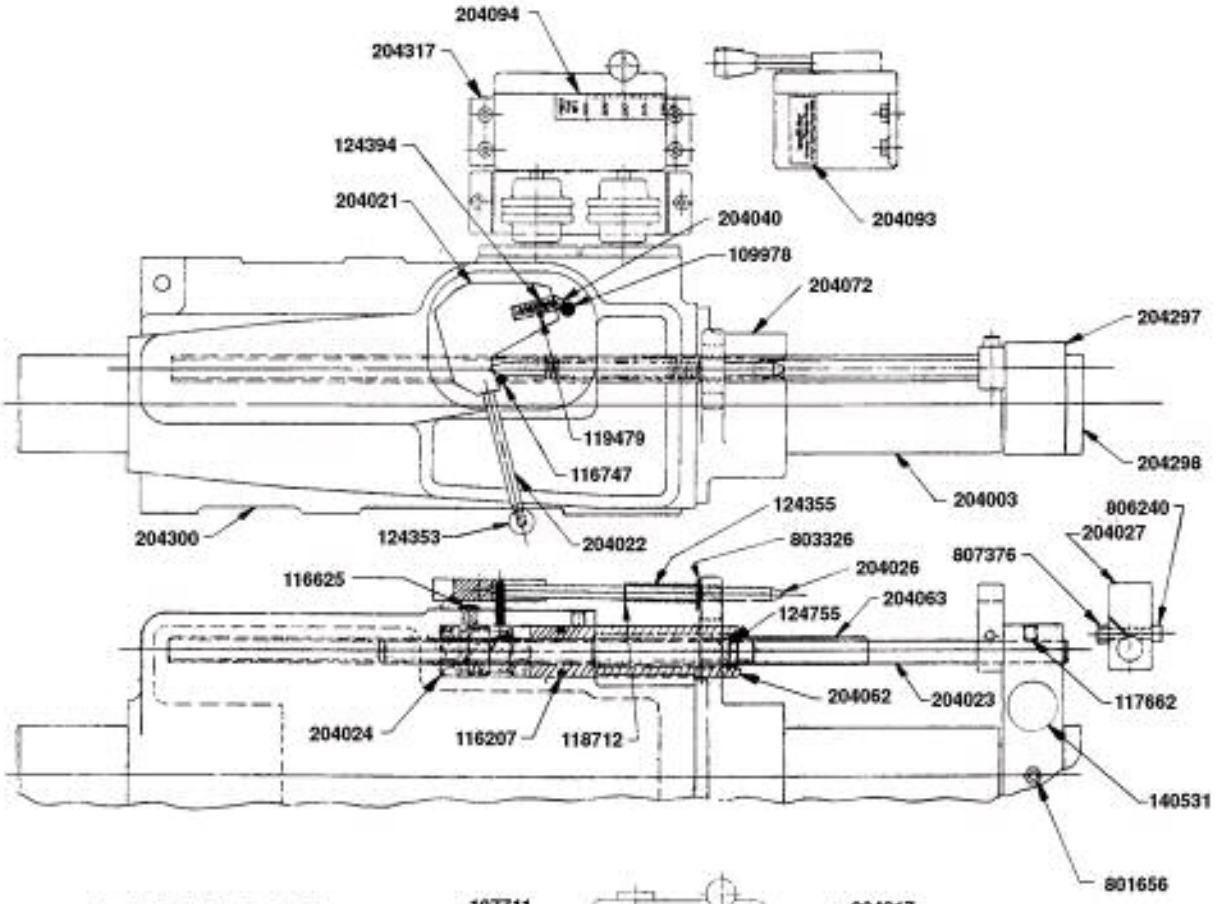
ELECTRICAL EQUIPMENT



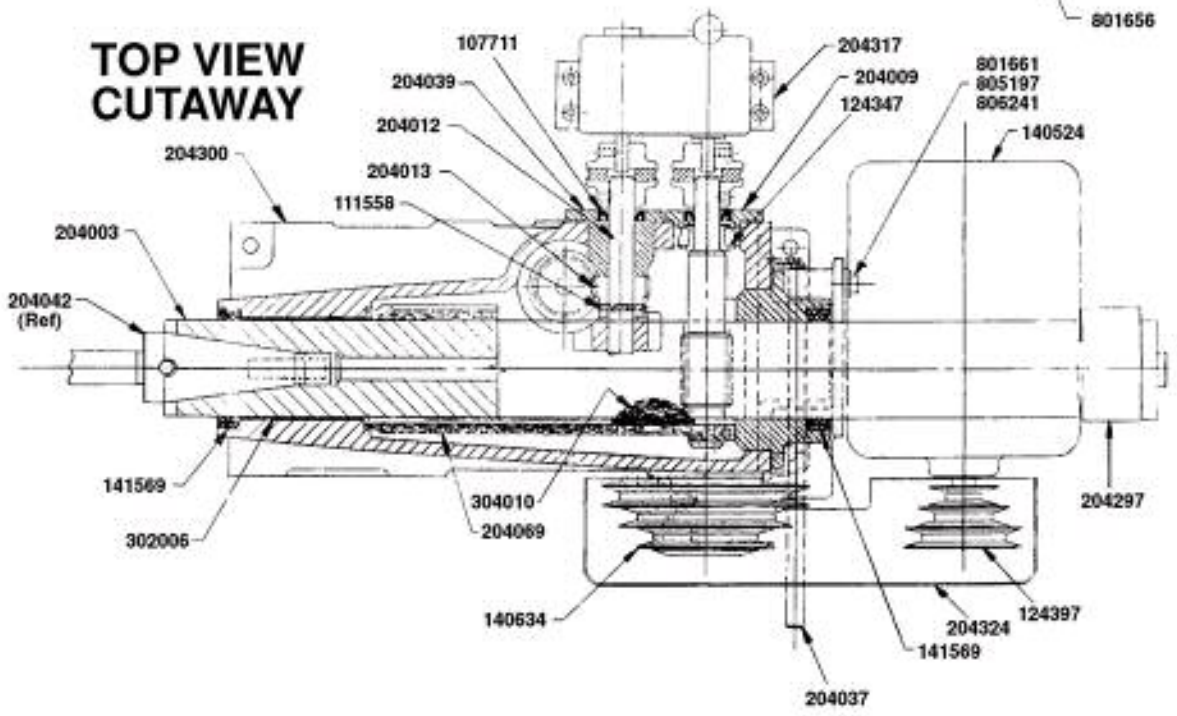
ELECTRICAL EQUIPMENT

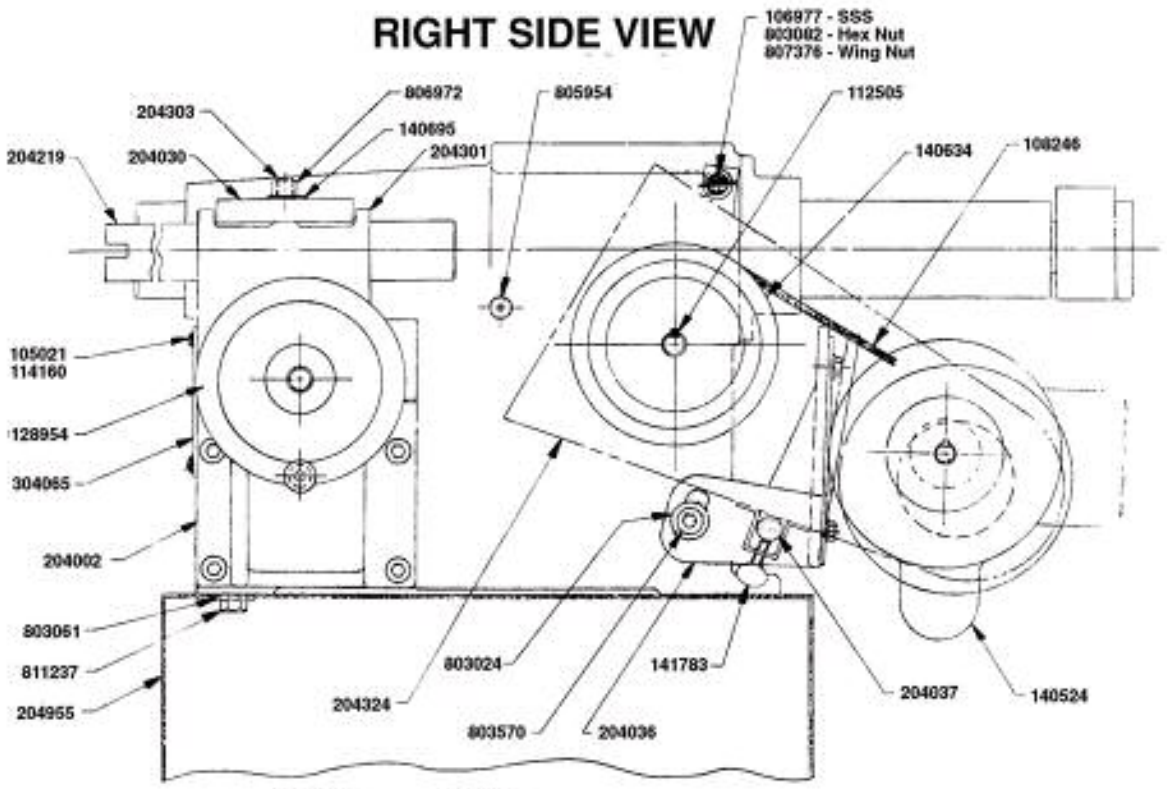
Item	Part No.	Description	Qty.
1	804-2043-00	Body	1
2	804-1413-57	Electrical Cover	2
3	800-8014-69	Strain Relief	5
4	804-1415-26	Wire Clip	1
5	804-1050-21	Screw (10-32 x 3/8)	1
6	804-1413-56	Switch	2
7	804-8657-78	Electrical Box	2
8	804-1050-21	Screw (10-32 x 3/8)	2
9	804-8109-79	Boot	1
11	804-1413-64	Motor and Light Decal	1
12	804-8030-34	Washer, 1/2	1
13	804-8657-91	Electrical Cover	1
14	000-1155-50	Washer, 1/2	1
15	804-1405-24	Motor	1
17	804-1409-99	Socket and Bulb Holder Assembly	1
18	804-1405-86	Bulb (110V)	1
19	794-8013-15	Pipr Nipple, (3/8)	1
20	804-2042-90	Light Bracket	1
21	804-8052-84	Hex Nut (1/4-20)	1
22	804-8666-49	Pipe Nipple Nut	1
23	000-0123-47	FHHCS (1/4-20 x 3/4)	1
24	800-8014-71	Strain Relief	1
25	001-1601-76	Bulb (220V)	1

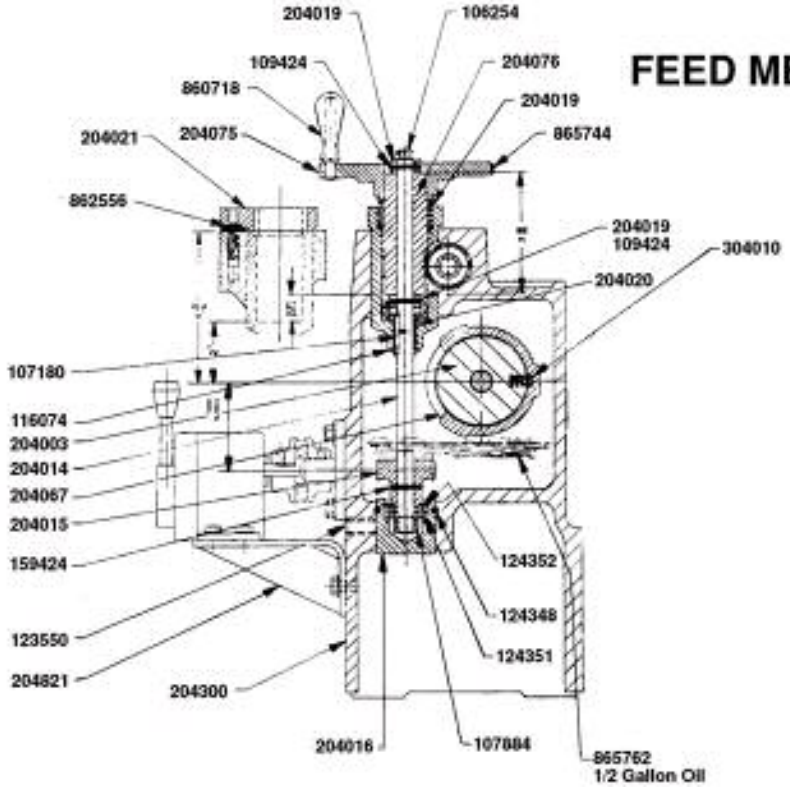
TOP VIEW



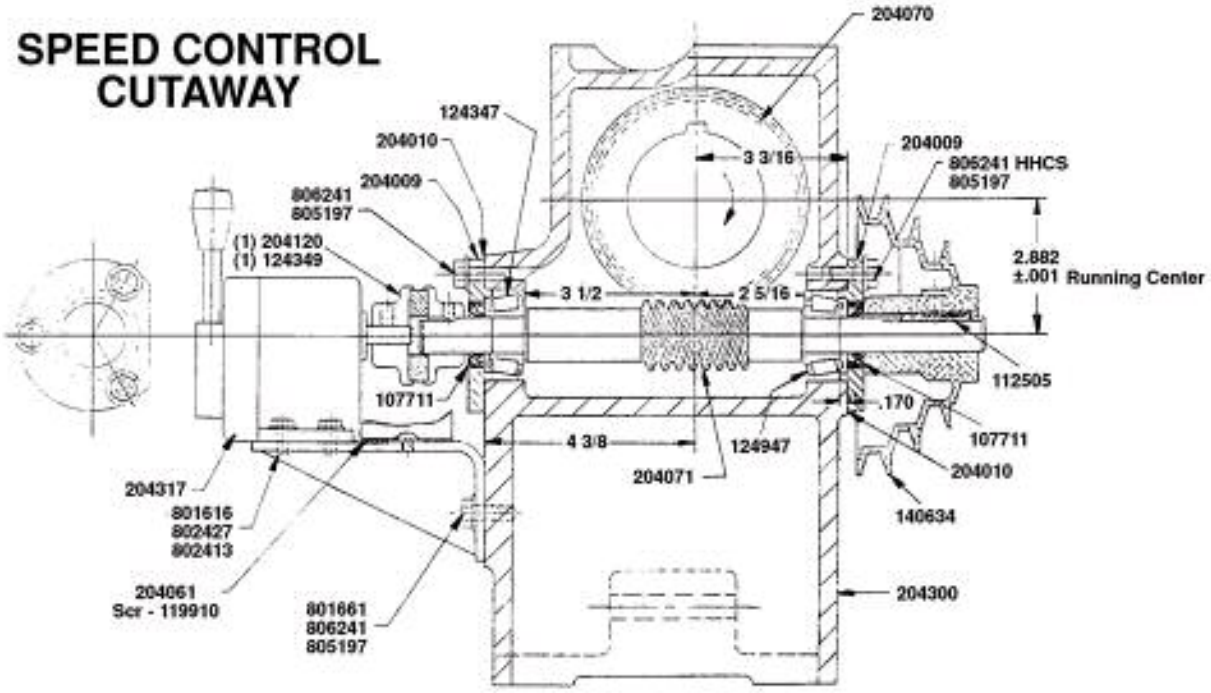
TOP VIEW CUTAWAY



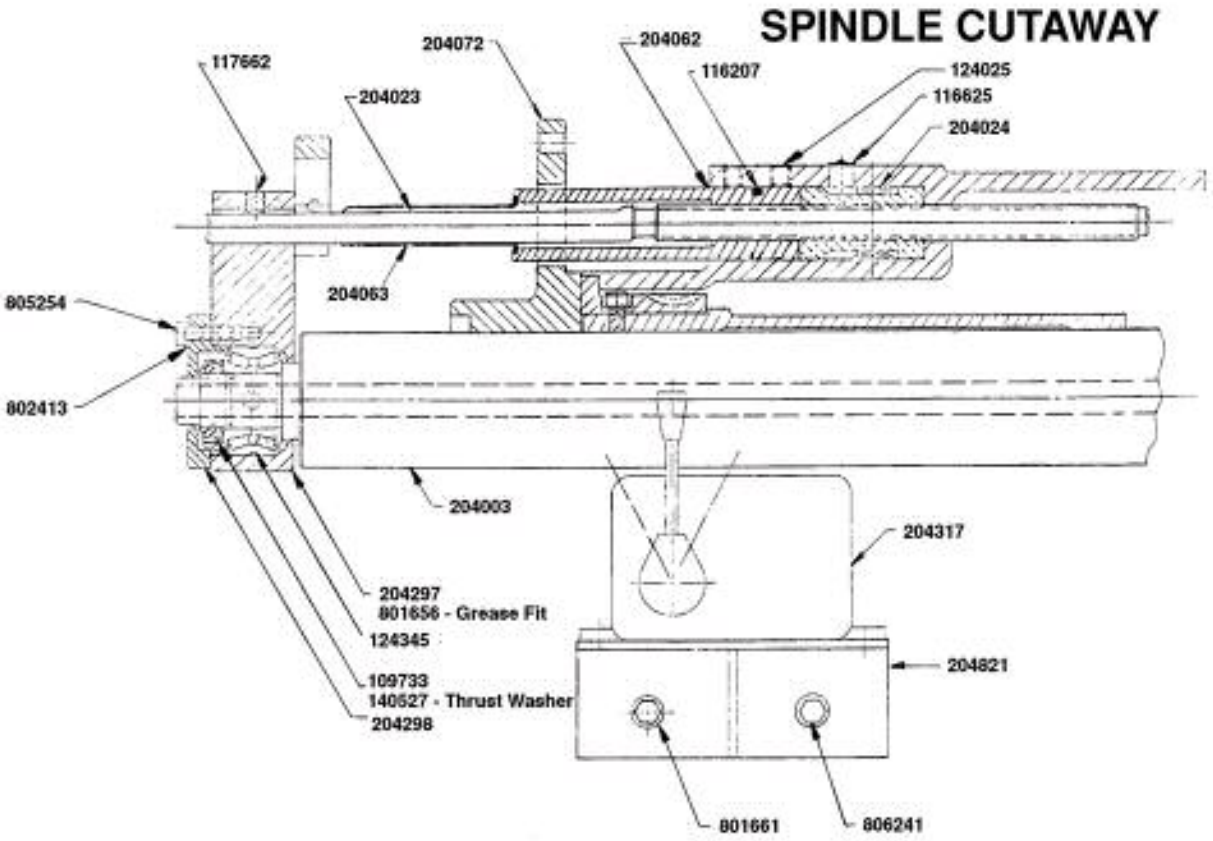

RIGHT SIDE VIEW
106977 - SSS
803082 - Hex Nut
807376 - Wing Nut
806972
805954
112505
204303
140695
204301
140634
108246
204219
204030
105021
114160
128954
304065
204002
803061
811237
204955
803024
141783
204037
140524
204324
803570
204036

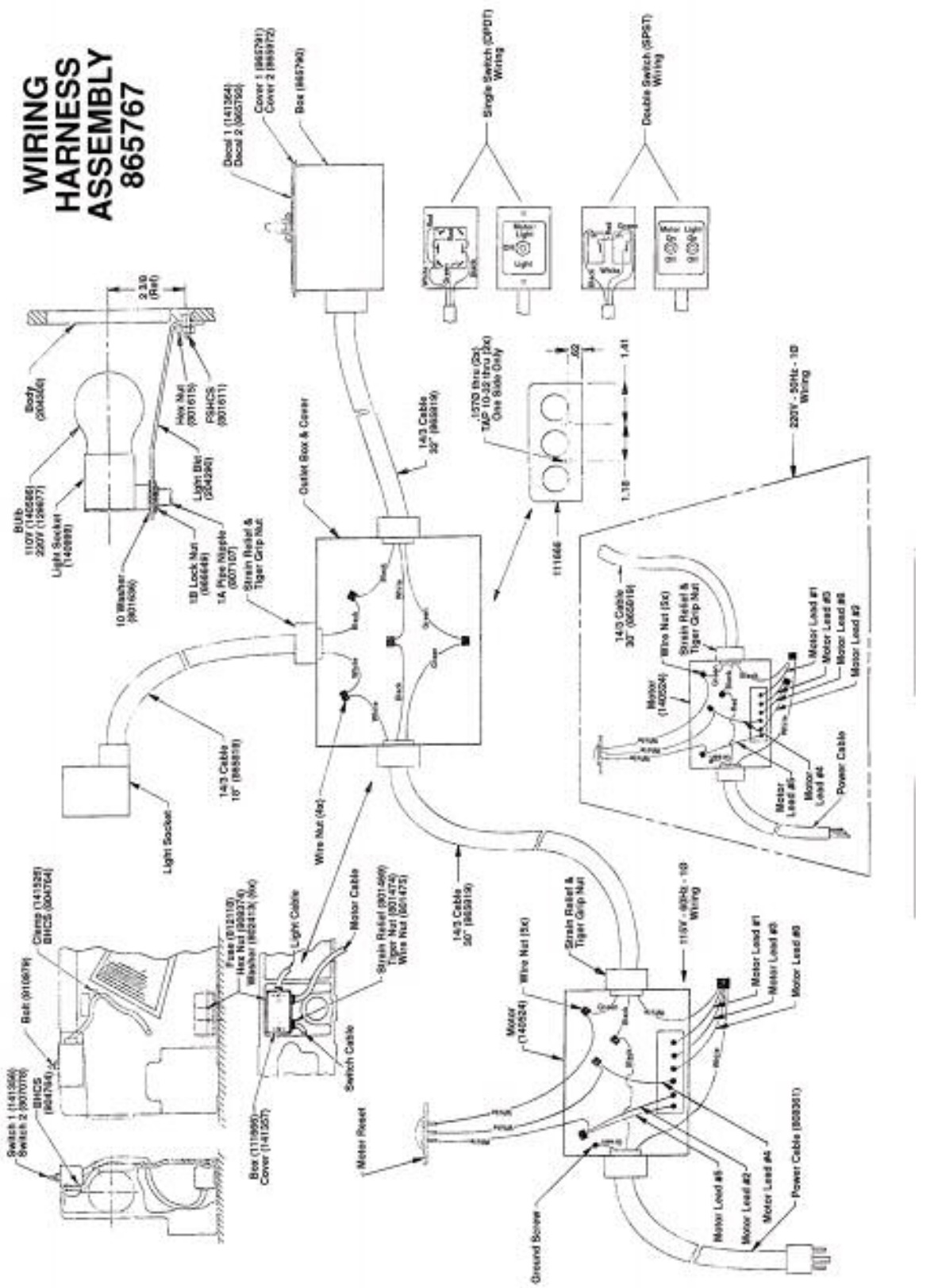

FEED MECHANISM
204019
106254
109424
204076
860718
204019
865744
204021
204075
862556
204019
109424
304010
204020
107180
116074
204003
204014
204067
204015
159424
124352
124348
124351
123550
204821
204300
204016
107684
865762
1/2 Gallon Oil

SPEED CONTROL CUTAWAY



SPINDLE CUTAWAY




WIRING
HARNESS
ASSEMBLY
865767
Single Switch (DPDT) Wiring
Double Switch (SPST) Wiring
Box (865790)
Cover 1 (865791)
Cover 2 (865972)
Decal 1 (141364)
Decal 2 (865792)
Body (904506)
Hex Nut (901615)
FSHCS (901611)
Light Skt (204290)
Bulb 110V (140566) 220V (139677)
Light Socket (140999)
10 Washer (901606)
1D Lock Nut (966446)
1A Pipe Nipple (907107)
Strain Relief & Tiger Grip Nut
Outlet Box & Cover
14/3 Cable 32" (865819)
.1570 thru (2x) TAP 10-32 thru (2x) One Side Only
1.41
1.18
.62
111666
220V - 50Hz - 1Ø Wiring
14/3 Cable 30" (865818)
Wire Nut (4x)
Strain Relief & Tiger Grip Nut
Motor (140534)
Motor Lead #1
Motor Lead #3
Motor Lead #5
Motor Lead #2
Motor Lead #4
Power Cable
14/3 Cable 16" (865818)
Light Socket
Wire Nut (4x)
14/3 Cable 30" (865819)
Clamp (141526)
BHCS (904764)
Bolt (910678)
Switch 1 (141266)
Switch 2 (907078)
Fuse (912110)
Hex Nut (909374)
Washer (902413) (4x)
Light Cable
Motor Cable
Strain Relief (901469)
Tiger Nut (901474)
Wire Nut (901473)
Switch Cable
Box (111666)
Cover (141257)
Motor Reset
Strain Relief & Tiger Grip Nut
Wire Nut (5x)
115V - 60Hz - 1Ø Wiring
Motor (140534)
Motor Lead #1
Motor Lead #3
Motor Lead #5
Motor Lead #2
Motor Lead #4
Power Cable (865821)
Ground Screw

Van Norman

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